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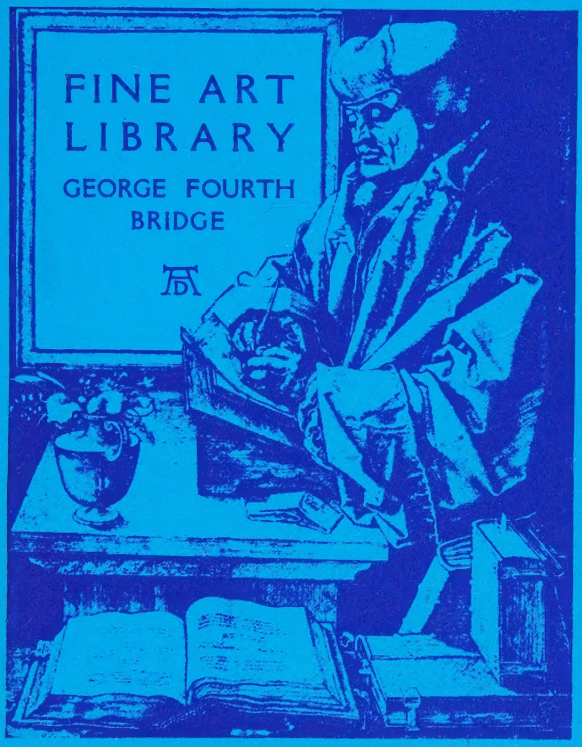

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THE

NATURE AND FUNCTION OF ART

MORE ESPECIALLY OF

ARCHITECTURE

BY

LEOPOLD EIDLITZ

ARCHITECT

London

SAMPSON LOW, MARSTON, SEARLE, & RIVINGTON

CROWN BUILDINGS, 188, FLEET STREET

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PREFACE.

ART deals with human emotions. It depicts them and depends on them for sympathy. Our training in the language of art determines the degree of sympathy we accord to it, yet the rudest and most uncultivated beings are measurably subject to its benign influence. This has led to the conclusion that taste is a common endowment, and, furthermore, that it is the quality which enables men to produce works of art, as well as to judge them. The same or a similar theory applied to any other form of human activity would be at once recognized as fallacious. Sharp-sighted persons do not by reason of that advantage become astronomers, nor those orators who enjoy eloquence in others. An ardent admirer of the opera or the drama would not for that reason alone presume to compose music or a play, nor dare to perform in either, but he does claim the right and the ability to judge a dramatic or musical performance by his *taste*, a fallacy which, when applied to a judgment in science, would be apparent without further argument.

To appeal successfully to human sympathy the artist must thoroughly understand the idea which is the cause of emotions, and the relation of his audience to this idea; and he must be a master in all technical expedients needed to create an intelligible picture which shall illustrate the idea.

That an artist who *re*-creates nature must be capable of emotions cannot be doubted or denied, but it is equally true, that during the process of *re*-creation in art the artist must be the master and not the victim of the emotions he delineates.

There is much current talk of enthusiasm in art, of genius and talent, which tends to delude the layman, and the would-be artist too, into the belief that these gifts of nature are mainly or alone sufficient to enable man to do art work, and also to appreciate its intrinsic merit. This is a fatal error. It is the welcome delusion of moral laziness, which longs to believe that artists are created, and not made. No amount of attitudinizing and fine frenzy will enable man to produce or understand works of fine art, but careful study and technical training are needed to accomplish this object.

It is quite clear that man is assisted in learning by natural aptness for and enthusiastic love of art, but *learn* he must in order to *produce;* the mere feeling will not help him there. But, says the man of taste, I can paint a portrait, and my feelings tell me when I am wrong, where the likeness is defective, and I can

in this manner eliminate the wrong until I arrive at the right. This is indeed the method by which man as a genus has arrived at his present perfection in art. Cosmic knowledge is made up of individual failures and experience throughout historic time. But it is idle to enact history over again in the compass of a single life.

Architecture not only neglects the knowledge of ideas as they exist at present, and the cultivation of possible ideas and their attendant emotions, but it also treats with contempt the technical development of monuments, relying entirely for art expression upon structural forms as they have existed in the past. This indicates the opinion, which is, however, not professed in words, that Architecture is no longer capable of determining its own forms, but that this process was exhausted at least three hundred years ago.

The architect is educated to be an admirer of past forms, most frequently of the forms of some special historic era, and his art creed may be summed up in the belief that by the use of these forms he must produce something which by its lights and shades shall be pleasing to him, or, as he states it, shall gratify his taste.

With this he hopes that it will also gratify the taste of an intelligent public, which is endowed with taste also, but in a less degree than the architect. It is believed that the architectural forms thus applied may be enhanced in art value by the sculptor and painter,

and may be endowed with stability by the builder or engineer, but that in the main the tendencies of these latter persons are in a direction contrary to that of art, and their work must be concealed or dissembled.

Under these conditions it is not surprising that Architecture vegetates somewhat in the manner of a dead language, which has served once to express grand ideas, but which is now but imperfectly studied and injudiciously applied to vernacular uses. That, in spite of this demoralization of the art, there are produced isolated monuments which command our respect, if not our enthusiasm, must be referred to the fact that earnest and able minds in the profession, and out of it, are conscious that Architecture must be something more than an archæological toy-shop; and that, although we are now floating in waters littered with the tangled weed of prejudice and error, there is beyond an open sea, where we shall again sail whithersoever the business of our voyage calls us, and direct the helm of our craft with a firm hand.

It has been suggested that this is an age eminently unpoetical—given to abstract philosophical inquiry, and that for that reason Architecture may not prosper. This is true to the extent, at least, that the outward expression of human relations is not, in our time, poetically conceived, and has its causes in special errors of the times, but not in a lack of human ability to foster poetical thought. Our great advances in music beyond the past, and the very respectable success which has

been attained in poetry, painting, and also to some extent in sculpture, are proof positive that the aggregate of art ability, and success of the nineteenth century, is, if not in advance, at least, equal to that of any known era in human history. Architecture alone has ceased to be a living art. Aside from all other considerations of its present state and merit, architects have certainly ceased to think and to express thoughts in architectural monuments.

Now Architecture is a species of language. It tells us as much of Greece as Homer did, and of the Middle Ages more than has been expressed in literature; yet it has been silent since the thirteenth century. Since then Society, the State, and the Church have made great progress. Literature, music, painting, and sculpture will convey to posterity a bright record of modern civilization and mental development. Yet the history of the Reformation, of the discovery of America, of the great advance of constitutional government and of individual liberty, of the developments of science, the mechanic arts, agriculture, and trade, within the last five hundred years, is nowhere expressed in Architecture. Architecture alone is silent. No! Not silent, for nothing done by man with premeditation fails to express *something*, and the monuments of the last four centuries express this: that Architecture has either ceased to speak of living ideas, or that modern architects do not comprehend the ideas of the times. The mechanic art of building never stood higher than it

does in its present perfection of theory and practice. The architect alone ignores its treasures, and continues to build as men did two thousand years ago, or perhaps not to build at all; for he deems this part of his work unworthy of his earnest solicitude. Whenever he resorts to modern engineering, he abandons his art as inapplicable; when he attempts the pursuit of Architecture as a fine art, he evades scrupulously all modern construction.

It is the object of this volume to inquire into the causes of the present condition of Architecture; to define the nature and function of Art in general, and of Architecture in particular, in order to show how Architecture may again become a living and creative art.

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INTRODUCTION.

In the search after truth, man meets with errors in the shape of seeming or partial truths. Errors of this sort have passed current as truths during every epoch of intellectual development, and it has become an important branch of instruction to guard against accumulated errors. In order to prepare the mind for the reception of the truth, modern Science has developed a system of progress, the main function of which is to avoid error: but beyond the scope of this system notions and prejudices, sentiment and jargon, still hold their place as temporary answers to vital questions. It is true these answers change from day to day in quality and in kind; but the supply is unlimited, and the crop plentiful at all times. If any field of human knowledge is to be brought under cultivation, the work of planting the good seed is but small, compared with the labor of uprooting weeds and destroying their germs.

Scientific men have disembarrassed themselves of the quarrels of the schools, and a truth established is

promptly admitted by all. Science maintains no relation with the general public beyond that of a teacher; and never appeals to it for a confirmation or acceptance of its convictions, simply because these convictions have ceased to be personal opinions. It is not so in art. Not only has no code of laws been established upon which her votaries are to proceed and her works are to be judged; but the principles have not even been settled upon which such a code may be formed. The material out of which principles can be developed is still in the chaotic state in which it has been gathered; and thinking minds are engaged in the task of putting it in some decent order. This work has advanced only to a chronological arrangement of existing art; and it is not surprising that the student of art imagines this chronological order to be a completed system of art philosophy.

The followers of art (music measurably excepted), and those of architecture in particular, are divided into schools and cliques, which, having unbounded faith in their own opinions but no clear views or convictions upon general principles of art, constantly appeal to the opinion of the public. This condition of things cannot fail to exercise, and does in fact exercise, a most baleful influence upon the progress of art. The public becomes a factor in retarding its development; and it is desirable therefore to review the mental condition of the masses in this direction. Common sense and taste are the mental faculties

employed in popular judgment of all phenomena, natural and artificial. Taste is the judge of art work, and common sense of all else beside. The function of common sense is to observe phenomena (facts), and draw conclusions therefrom. Now this has been done by common sense for the last ten thousand years with more or less success, but with this final result, that it has discovered vast errors of sensuous perception (observation of facts), and has devised means of guarding against many of these errors and methods, of making due allowance for others which cannot be avoided, also a system of argument which ensures sound conclusions, and, finally, a respectable series of tests, by which the accuracy of these conclusions may be established or disproved. The peculiarity of the common sense of the nineteenth century is the firm belief that it can perform its work quite as well, in fact, better and quicker without the accumulated results of the common sense of the past. This is not only very singular, but is pregnant with untold danger to truth. Taste is supposed to be the capability to experience a pleasurable emotion in the presence of a work of art. This capability is claimed by every one, and is freely made the test of the merit of art work.

As may be imagined, taste and common sense have exercised great influence upon art. This influence it is intended to discuss. At present, it is only necessary to say, that the conclusion reached by taste and common sense with reference to art is that the nature of

art cannot well be defined; and that it performs no function in the social economy excepting, perhaps, that it affords the aforesaid pleasurable emotion: and, as this pleasurable emotion is of a transient character and of intangible value, it remains to be concluded that art is superfluous, and can well be dispensed with. Common sense adds to this, on its own account, the dictum that art is not susceptible of critical examination, and must, as the offspring of the imagination and a morbid sentiment, be abandoned in this age of reason. And but for a few individuals who wield considerable influence in society, and who unaccountably seem to perceive in art not only a needful civilizing influence, but also a value measurable in money, common sense would inevitably abolish it from the face of the earth.

To devise remedies which shall arrest the decay of art, and especially of architecture, to arrive at a clear understanding of its nature and function, and to mature a system which shall direct its practice in the right channel, it becomes necessary, first, to review the peculiarities of its present condition, the views held by the public, and more especially by those who are recognized as of authority on such matters; to examine the relation of the professional architect to his client, to the public at large, and more especially to the church, which has ever been the greatest patron of architecture; and, finally, to consider the existing theory of art in general, and its influence upon architecture. The

philosophy of art has heretofore mainly discussed the nature of beauty, and of the pleasurable emotions caused by it, with sole reference to the relation of these two phenomena, and without taking cognizance of the intellectual function and meaning of art. That art deals with ideas, is universally admitted; but it seems desirable to know exactly how the idea is finally expressed in matter: that is, how it assumes a physical form. The exact definition of this process may lead to a better understanding of the nature of beauty, and hence, also, to the nature and function of art.

The boundary between the industrial arts and the fine arts, the properties possessed in common by works of fine art and those of nature, and the exact meaning of the ideal, of imitation, of the ugly, the ludicrous, and the sublime, depend upon a clear understanding of the materialized idea, as we find it in art.

Architecture demands special consideration to show the application to it of the law of the ideal and imitation as governing art in general; and, further, to elicit the exact conditions of proportion, and the use of carved ornament and color decoration.

If architecture is to be a living and creative art, the study of styles must be directed to the art principles manifested in the relation of their forms to contemporary ideas and knowledge of construction, to the end that new forms, based upon modern ideas and the present development of construction, may supersede the forms of the past.

The ideas of the present day are not expressed in our monuments. This may be owing to the nature of those ideas and to the outward forms which they assume; and it is proper to inquire into that.

Criticism, when no longer under the dominion of taste, must be deputed to reason, based upon recognized art principles, and henceforth must become analysis.

From the foregoing may be deduced what is needed for the cultivation of art, and more especially of architecture, in the studies and in the professional practice of the architect.

PART I.

PRESENT CONDITION OF ARCHITECTURE.

CHAPTER I.

COMMON SENSE AND TASTE.

THERE are men who believe not in God, but they all believe in their own "common sense" and "taste." God made the universe, and man has, from time to time, caught stray glimpses of it, and hence thought himself wise. This universe is beautiful, and man, recognizing this fact, thinks he has *taste* (a faculty to discover beauty). This universe is a wonderful thing to dream about; but to talk about it is sheer impudence, for the wisest have seen but a very minute portion of it, and none of us can say with certainty that we see any part of it, no matter how small, with sufficient discernment to say that we have seen it rightly, that we know it well, even this little part of it. We know not even ourselves, either physically or mentally. We see the sun rise, and the flowers as they grow; we see the crystallization of matter, and the vast diversity of things alike. Some of us see the earth move in its orbit around the sun, while others have gone so far as to detect the sun moving among the stars. We find it all very beautiful, because of the great mind which everywhere moves matter in obedience to law. When we sum up, however, the substance of cosmic knowledge, of the little all some of us do know, the knowledge laboriously accumulated from time to time, and compare it with the magnitude of the questions we would fain ask of nature, and with the answers that

are hidden from us, and which, at the rate at which we have lifted the curtain from the mystic face of nature, will probably remain hidden from man for all time, we must come to the conclusion that our boasted knowledge is but a feeble glimmer of the great light, and that our overwhelming sense of its beauty must be the merest foreshadowing of gigantic glories, the vision of which our poor mortal frame is not capable of entertaining.

In olden times, when man was more childlike than he is now, he worshipped the sun, and brought offerings to it upon altars erected in the woods—for of all the things which he could see, the sun had done, and was constantly doing more for him than all else beside. Perchance he knew that there was a power beyond the sun; that, at least, the sun was but a part of a whole greater than itself; perhaps he knew not and did not dare to presume upon that which he did not know, and so, whenever he met in nature friendly help, or opposing forces, he painted pictures in childlike simplicity of forms of man and beast, and of natural things, which kept before his mind those things as things that no doubt *are*, and as things which we may picture, though we may not know them. And, as man learned to use his senses, and as his intercourse with man and things brought to his mind's eye innumerable complications and perplexities, things to battle against and to overcome, things to be overcome by, relations which brought him joy, and others which overwhelmed him with sorrow, relations with things which he could see, hear, or feel, but not understand, then this world became peopled for him with powerful beings, giants, monsters, gods,

demons, with shadows, spirits, goblins, with men and women of good and evil intent, beings of the woods and of the fields, of empty space, of darkness, and of light, of the water and of the air, thousands of unseen and unheard-of existences, constantly busy interfering and regulating his poor life, and punishing, rewarding, and guiding him throughout every step of it, and, perchance, far beyond the grave throughout eternity. It is worth considering, this childlike condition of man, which admits that it knows but little, and that it dreams of much more, a dream of multitudinous forms which are somehow more closely interwoven with his life than the scanty things he does know. Man must supply himself with forms of things he knows not of; he cannot think of them as things unknown, or else they would not be things at all. He will have them endowed with features, qualities, powers, caprices, passions, and virtues, as the imagination mixed with slight actual experience may prompt. Man is driven by nature and by his fellow men, and if he is tempted, and pressed, and hurt, and punished, he is again made whole, and nursed and made strong by powers apparently outside of him, powers ever stronger than himself, powers alike, whether they treat him lovingly or whether they rise up and oppose him in his path, always prevailing unless he be protected by other powers, equally mysterious, equally unfathomable. Man, in this childlike frame of mind, found that all things were his masters, the air, the sea, and the earth, all the elements and the stars above him, all stronger than himself, and he ranged them all in various forms, human and otherwise, as a series of governing powers which commanded his fate. Is

there not wisdom in this dread of the unknown, this regard of powers stronger than ourselves? Would it not have been the height of folly to say, "I know but little, and beyond this little which I know there is nothing"? A conception, no matter how imperfect, of the thing we do not positively know, is not the philosophic solution of a question; but what if the question cannot be philosophically solved, and the thing is pressing upon us on every side, is driving us well nigh to despair, shall we say it *is* nothing, because we know it not; or may we not reverently dream about it, and on finding that it hurts us, say that it is terrible, and on finding it befriends us, say that it is beneficent, kind, loving, and lovable? And then again, if we can paint a picture of it in our imagination, in words or in any way, may we not master it in so far that we may better understand it, establish relations with it, at least shape our course with reference to some sort of tangible existence, which performs a certain end, so far, at least, as we are concerned?

Now mark how wonderful! That man, in his simplicity and ignorance, may boldly ask of nature any question whatever, and receive an answer to it. A true answer too! Not as a whole, perhaps, and it may not be the whole truth, but it is true for the questioner and for the time being. And his time is very short. It is equally wonderful how tenaciously man clings to these crude expressions of nature, when once he has learned to know them. He believes in them because they are true, and then again he believes in them knowing them not to be true. St. Augustine declared that it was nothing to believe that the

whale swallowed Jonah, for he would glory in believing that Jonah swallowed the whale. Doubt a man's scientific knowledge, tell him that the earth is not revolving around the sun, that you can see for yourself that it is the sun which is revolving round the earth, and that your common sense tells you to believe in what you see; he will not be angry with you on that account; he may try to explain the matter to you; but if you cannot comprehend it, he will pursue you no farther; he will certainly not hurt you because you do not see things as he does. Tell him, on the other hand, that you do not believe in transubstantiation, and he will burn you alive and glory in it. It is wonderful, too, how prolific time has been in these productions of the human imagination, as compared with the positive knowledge acquired in the same time, how beautifully some of them have been painted, true works of art, pictures in words, in stone, and on canvas. What is most wonderful of all is, how beautiful and beneficent they still are, after they have ceased to command implicit belief, and their mythical character is recognized by all. Homer has made many converts to morality, and spurred on many youths to lead a noble life since the belief in Polytheism has ceased. It may be asserted, without fear of contradiction, that the moral influence of the Bible will continue for all time.

We may single out as very wonderful and curious this fact, that whenever a strong mind discovers one of these great poetical thoughts to be inconsistent in part or in whole with philosophic reasoning, when he becomes so convinced of this as to make it appear to him a deceit practiced upon himself and others, he at once repudiates all true thought, all moral merit developed

in it, and declares war against this idea, doctrine, dogma, tradition, legend, or whatever it may be called. And yet, while fighting this isolated idea on the ground that it is not *absolutely* or *wholly* true, he cherishes a thousand others of the same kind enthusiastically, which are equally unsound, and he is ready to die in their defense. Take, for instance, Martin Luther. The practice of selling indulgences as Tetzel did was rather a vulgar way of dealing with the confession of sins and their divine pardon. It did not differ, however, in principle from the old method as practiced in the Catholic Church before Luther's time, or as practiced in that Church to-day. That man should confess, and be forgiven, is as just a dogma as that confession implies repentance. To buy absolution for a price is a confession of sin of the most valid kind, and no doubt sincere, for no man would part with his substance did he not feel that he had sinned, and that sin is a grievous thing. What was Luther's objection to all this? Not to the confession, nor to the forgiveness of sin. It was the suspicion that the forgiveness of sin, after all, had less to do with the transaction than the raising of money, and the further suspicion that the Pope did not spend this money altogether for the good of the Church. Did Luther thereupon analyze his knowledge, and cast out as unworthy all that was not absolute? It is true that he doubted the sacrament of celibacy sufficiently to take unto himself a wife; but beyond that it would not be difficult to enumerate a long list of erroneous thoughts to which Martin Luther vigorously clung; let us mention *the devil*, at whom he threw an inkstand.

Now what happens next is most curious of all. After Martin Luther has discovered the indelicacy of selling absolutions, the little minds all over Europe begin to doubt all things; small minds become upset, and think that they have somehow helped Martin Luther in his great discovery, and that they are possessed of common sense by which they can judge all things as well as those things can be judged of with the help of God or of the accumulated knowledge of man.

The principal gods now worshipped throughout the civilized world are individual common sense, taste, public opinion, and the voice of the majority.

Think of individual common sense, and let us deal justly with it. Let us admit at once that a drop of water is water, as much as an ocean. But a million of drops do not make an ocean. If we need an ocean, it will not do for a drop of water to say, I am an ocean, nor for a million of drops together. And when we have admitted that individual common sense is like the drop of water, and that the sum total of cosmic intelligence is like the ocean, it does not become one of this nineteenth century to parade his common sense, and sit in judgment on the church, the state, political economy, science, art, agriculture, and trade. When we compare individual common sense to the drop of water, we must admit that we have not been quite fair to the latter, for we know that every drop of the ocean is capable of performing its work, of resistance to pressure, of evaporation, of a thermal medium, precisely as well as every other drop; and when we speak of the work of the ocean, we deal, in truth, with the exertion of all the drops of water contained in it; and if any one drop were to ask at our hands

for its due share of praise, we should have to say to it, "There is not another drop in the ocean that can be said to have done more work than you did." Cosmic knowledge, considered as an ocean of individual common sense, comprehends, on the other hand, the work not of all, but of a few individuals. It would be a curiosity in science to possess an approximate computation of their number during our historical period. One in a million of human beings would be no exaggerated estimate. If this is true, then, while one man is doing something to advance knowledge, a million of men are doing nothing to the same end, unless, indeed, we admit that they are helping that one by giving him the countenance and moral support of their mere presence; but this cannot be true, either, for two very good reasons. The first is, that the contemporaries of any group of wise men are far behind them in knowledge; and the second is, that so far from helping them, the masses are, and always have been, rather inclined to oppose them; which, fortunately, has not amounted to much.

Now let us watch one of these millions of humanity boasting of common sense, and see what all this common sense is doing during a lifetime.

We know that one of that million is pursuing science as best he can, without taking part in the turmoil of the day, without caring what benefit he or any one else may derive from this scientific work, content to ask of nature questions relating to observable matter, and accepting his privilege of observing as an answer thereto. He observes diligently, and when he finds a fact he does not exult and boast of it, but goes on with the search for the magnitude of the fact. He finds that a stone falls! He is not content until he knows how

much it falls within a given time, in double the time, in half the time; and when he has learned to know this, he is fully rewarded and ready to do more work of the same kind. He is not eager to keep his knowledge secret, nor to derive from it personal benefit; but if he finds that in the pursuit of his work he is indebted to any one for information which helps him on in his inquiry, he is very careful to give him credit for it.

What are the rest of the million doing all this time? To understand that fully we must first know the problem before them. It is to keep soul and body together by any and every means which do not prevent others from doing precisely the same thing. Also to learn to know the nature of that same soul and body, and their respective conditions before and after they met. Also to receive and give exact information how all things came about, where and when they are going, and what is coming next.

The man who has had the best means, the method, and the ability to answer these inquiries, if answered they can be, is probably the scientific man, but it is not on record that they ever asked him. This is, perhaps, as well, for he would have told them that by diligent work an answer might be had in perhaps ten thousand years; but that one could not be sure of giving the required information even at the end of that time. Now, these people were pressed for time. They wanted to know at once. This was a matter of great import to them, a question of life and death and of the hereafter, and indeed there were various theories afloat already by which some of these questions could be answered; while others, if they could not be explained by the same theories, could no doubt be

explained by others. In this manner grew the human knowledge of the unknown, knowledge needed to supply immediate mental wants. Wherever a power or a force was encountered which subjected humanity to its will, it was idealized into a material shape, endowed with the qualities and attributes needed to perform its work, and placed somewhere in the ranks of the constantly accumulating deities, fates, demigods, saints, heroes, devils, nymphs, giants, dwarfs, and goblins which peopled space. Whenever human action needed guidance, these gods and other powers conveniently expressed their wishes, and these became law, at least for the time being. Whenever the influence of these laws became weakened, men proclaimed their precepts anew, and presented miracles as the credentials of their ambassadorship, a species of divine privilege to arrest at pleasure divine laws. The object of all this at all times was to enforce some system of morality, a code of procedure in all human relations, and also to furnish a satisfactory solution of current human questions. We may say that in these ideal pictures of possible truths popular knowledge has consisted from the beginning of time to this day, and this will probably continue to be the method by which the great majority of mankind will be informed for all time to come, and a very excellent method it is in the absence of a better one.

Many systems of historical, poetical, and metaphysical nature, all of them explaining more or less accurately the origin and the cause of things and the powers which govern them and us, and also advancing a code of morals for the guidance of man with a view to his present and future condition, have always existed and

do now exist. They all claim to be in their essence a divine revelation, but this divinity is denied by all men to all systems but their own.

The Christian religion is no exception to this general rule. Its divinity is denied by eight hundred millions of men, or more, in spite of the fact that its followers constitute a majority of the inhabitants of the civilized world.

Some of these systems have ceased to be religious creeds. They have at this day no followers who believe in them, or who believe that they were ever true systems in any sense. They are not forgotten, however, but continue to exist as mythologies and imaginative poetical explanations of the unknown. Modern literature and poetry refer to them, and their moral and civilizing influence continues to be felt and is recognized by all men.

All this goes to show that outside of positive knowledge there is a poetical knowledge or the knowledge conveyed by art (ideal knowledge), which promptly answers man's questions in such a manner that he may understand the answer. It is an answer suited to his capacity, such as is given to a child sometimes, to satisfy a craving for knowledge which it cannot fully comprehend. These answers are not necessarily untrue, but they are often imperfect, intended perhaps to be modified from time to time, as much as this may be done by reasonable interpretation within the limits of their form and extent, and then to be rejected as truths, and to yield to other forms of similar poetical knowledge.

This poetical knowledge, moreover, is entirely the result of the imagination and of the emotions, while

positive knowledge is the result of observation. For instance, when a philosopher desires to know whether atmospheric air impedes heat rays and how much, he does not place himself before a fire and judge of the result from his personal sensation; he understands too well that, unaided, we cannot see, hear, or feel correctly, certainly not numerically. Reason inquires into the nature of phenomena as perceived by the senses with the express understanding that our senses are but imperfect instruments for the acquisition of a true knowledge of matter, its motion, and relation; that these senses of ours must be assisted, watched, controlled, and tested, and, above all, that their observations must be examined and verified by known methods which determine the accuracy of quantitative elements of phenomena. Reason analyzes the conditions, constructs apparatus to meet these conditions, and observes with the help of this apparatus.

The imagination proceeds by a short cut to explain phenomena, not by an examination of the conditions, or of the facts, but by using any convenient explanation as it presents itself to the mind as capable of accounting for the phenomena imperfectly observed. The existence of fire as an element, caloric as a substance, are instances of the kind in science. The explanation, by the maxim that nature abhors a vacuum, of phenomena caused by atmospheric pressure, is another.

More often phenomena are explained by a special force invented for the purpose. This species of invention, however, does not deserve that name, for it amounts in fact only to a desire to explain, not to an actual explanation. The success extends merely to

the naming of the thing unknown, while the definition of the thing named utterly fails. We speak of reflection as a mental function when we refer to a comparison of matter and its motion observed by the senses. The ideas of space and eternity are strictly confined to these names, and have a value only so long as they refer to a relation of matter (space) or a motion of matter, time (a succession of events), while outside of matter they have no value, and are not capable of definition.

The education of the majority of mankind is derived, however, from art productions, which deal with various questions in this manner, and which never fail to answer questions as accurately as the imagination of the author is able to comprehend the conditions.

These art productions are pictures, sculptures, legends, novels, plays, songs, traditions, and all sorts of mental impressions rendered in matter. Most men derive from these sources their knowledge of history, moral philosophy, political economy, art, science, and religion.

Common sense means the faculty of drawing conclusions from impressions which are the result of sensuous perception unaided by previous knowledge.

It is the current popular belief, that to see, hear, or feel, means to convey to our brain a just appreciation of the form, color, size, sound, and texture of objects observed; and that we may further, by the simple exercise of a faculty called reflection, form opinions as to the nature of these objects, the manner and process by which they came to be, and the properties which they possess. This is a very serious error. Our sensuous perception of objects conveys to the brain an impression of them as seen in their environments,

which is a totally different thing from a knowledge of the objects themselves; and reflection means nothing more than a comparison of two or more sensuous perceptions which may have been had at different times, and which are one and all subject to the same conditional perfection. We see a distant mountain, and what do we know of it? Its outline is that particular elevation which is turned toward us, and which is no indication of its general form. Its color is a deep violet; probably not the minutest object could be found on the face of that mountain which in fact has that color. Its size?—we know nothing of that, nor can we establish a relation between its magnitude and that of other distant mountains which we see at the same time. Nor are we any more accurate with regard to objects near the eye. Compare the height of a goblet and of a hat by measurement and see how incorrect was the idea you had of their relative height before you did so. For thousands of years men believed that the sun revolved around the earth once in twenty-four hours, because they *saw* it. For a similar period of time the fixed stars were supposed to be very small bodies compared with the sun, and it was thought that they also revolved around the earth. The planets, after centuries of close observation, were supposed to march around the earth in erratic orbits, and hence their name. Galileo, in reporting his first observation of Saturn through a telescope, says that it seems a combination of three planets joined together. The earth upon which we live was believed to be flat, because men were sure that they saw it so. Fire was accepted as a body because every one could see and feel it.

The man of common sense believes he can see correctly, and is surprised when we tell him that the sun which he sees on the horizon at that very moment has set eight minutes before. If we cannot see things as they are, can we draw conclusions from what we see? Clearly not: nor can we draw sound conclusions from premises positively and correctly known, unless we have learned to know the scientific limits within which conclusions may be drawn. A light removed to twice the distance from you will not afford half the amount of illumination which it did before. It will only give one quarter that amount. A beam of double the length of another beam, if loaded with the same weight per foot, will sustain that load if its height is doubled; but if its height remain the same, its thickness must be increased four times to perform the work. The moon seems smaller at the zenith than at the horizon, and the man of common sense would conclude that it had moved away from the eye; what is true is that it is four thousand miles nearer to him. And yet the man of common sense strikes out boldly into the ocean of phenomena which surrounds him, and insists that he can see and hear and know by virtue of his natural faculties, and boasts of his contempt for so-called book-learning. He gives opinions right and left on all subjects, and lives up to these opinions sometimes, and insists that others shall do so always. To him nothing is established; everything may be controverted by the conjectures of his own brain, excepting the stock prejudices to which he has subscribed because he is born in them and has been surrounded by them all his life.

He denies what he cannot understand, and believes

in other things because he cannot understand them. As much as he sneers at science, he is confident that at an early day science will teach us how to perform the labor of life by machinery, and give us a perpetual holiday thereafter. His favorite theory is that this will be done by electricity, because this is the species of natural phenomena which was last brought to his notice, and he knows least of its nature and more of its practical results. He believes in public opinion. He is, he thinks, part owner of that opinion, being a member of the public. You cannot convince him by an argument; but if you state your view in some newspaper, he will read it in the morning, as public opinion, and retail it to you in the afternoon. He has faith in majorities. He would decide all questions by a vote. Now this is a very singular notion. We all know that if you gather a congregation of men, whether you take them from the next scientific association or the next ale-house, from the vestry of the principal churches or from among hod-carriers, whether you deal with these aggregations separately or mix them up in one or more bodies, always and ever you will find that in a body of men, no matter how constituted, the number of wise men is small compared to the number of unwise, and the wise men are always in the minority,—and yet this man will have all questions decided by majorities; he thinks, and he says, that ten men know more than one; or, in other words, that ten crab-apples make one pine-apple. Very singular this, but this is not all. The man of common sense insists that individuals may be tyrants, but that the masses are ever just and charitable. He says the people best know what they want, and asks why should

they not have it if they want it? they know where the shoe pinches, let them prescribe the remedy. Yes, indeed, if we could be sure that they are as familiar with the remedy as they are with the disease. Besides we may doubt that they know whether the shoe pinches or not. In nine cases out of ten it is not the *shoe* that is at fault, but the rags and pebbles inside of the shoe which have been allowed to drop in through neglect or have been put there through mistaken judgment.

If you wish to see the man of common sense in his grandeur you must observe him in his prejudices, in his hereditary errors. There he is gigantic. He rails in speech and in print against the superstitions of religion. The idolatry of the Catholic Church is his favorite theme; the worship of saints is an abomination to his eyes; he would destroy every saint and reduce the church of living ideas to a barn filled with nothingness. Why not let the poor man worship the saints? If it is difficult for him to comprehend the concentration of attributes as we would embody them in the word God; if to understand charity, humility, faith, self-denial, chastity, he needs the material representation of these virtues in veritable men and women who are supposed to have possessed them, and if he will prostrate himself before their images in stone or wood, and worship, why not let him do so? It will make him a better man for a time at least. Now the man of common sense, if he be an ignorant man, boasts that modern Protestantism has done away with all false gods, and that the people are just as good without them. The solid food of saint worship has been exchanged for mental intoxication, for the austere

dread of an unrelenting hell and the despair of those who fear that they are not of the elect. The poor and ignorant are in search of spiritual food in a material shape, and idols they will worship, with the simple difference that the idols are removed from the shrine in the church, and new ones are put up in the heads of the poor parishioners.

If the man of common sense be a learned man, perhaps he will suggest Plutarch's lives in place of the saints. This is well so far as it goes, but the people will have to find their saints in Plutarch's lives, and if they will not or cannot read of them there, we must perforce make statues of them and pictures, and they will worship these.

Common sense is driving poetical knowledge, poetical thought, out of society, the state, and the church, and substitutes nothing for it. When Greece began to doubt her gods, it was her philosophers who took an active part in opposing them; the gods had to yield, but not to Greek philosophy: they yielded to the poetry of Christianity, which in one comprehensive and flexible poetic system replaced the cumbrous mythology of antiquity. Modern common sense is slowly shattering the strong walls of mediæval state and church, which are toppling down, stone after stone and brick after brick; when the fabric disappears, man will live intellectually out of doors and without shelter, and will have to learn with great labor how to build anew. What he will build we may presume to conjecture. It will not be a university solely, for most men cannot live there; they must labor for their daily bread. Perhaps there will be theaters, libraries, museums, and lecture halls in abundance; there will

doubtless be courts of law, parliaments, palaces, and churches of some kind. If humanity has really outgrown the rude wood-cuts of saints, then we must supply it with more artistic pictures. Virtue must be idealized in matter in some form; but we must not sneer at saints and invite the poor laborer into the portico of the temple to argue and be argued with, on moral philosophy; he has no time to go there; his despondency needs a quicker remedy than learned disquisition can furnish, and if you do not supply one he will seek consolation in the cup, and thus escape trial and trouble, at least for the moment, and become more brutish and degraded after every draught. Deprived one after another of his processions and feasts, he is no longer happy and joyous, but downcast and sober; he has ceased to sing and to dance. He and his fellow laborers assemble in dreary halls to hear harangues on political economy and on dry statistics; his great aim is to work less and get more wages, as though by that means his share in the aggregate production of labor could be increased.

He desires that no one belonging to his craft shall do more work than himself, no matter how inferior in ability he himself may be, and thus he cuts off all chance of ever acquiring capital, the thing which above all others he hates, unless it be possessed by himself. He wants to vote in order to become the master of those who govern him; really, however, he continues the slave of the creatures of his mistaken or misguided judgment. We should not quarrel with common sense because it has granted to men the privilege of voting, of doubtful value though that privilege be, had it supplied him at the same time with such knowl-

edge as he needs to vote well. This knowledge is not to be found in political pamphlets or in essays, nor in harangues at the hustings; all this is chaff which fills his poor stomach without feeding him, and which only creates a desire for strong drink, which results in broken heads. If the poor man must vote, why not prepare him for voting? Common sense has tried to do this, having talked, written, and printed by the mile; but it is of no use. Poor ignorant common sense! The poor man does not understand your talk, you must speak to him through pictures. You are yourself the greatest enemy of the only sort of knowledge which can benefit him. If he must vote, let voting be made a noble and honorable thing; it must have peculiar surroundings; men unused to voting, who do not understand the meaning and import of a ballot, cannot vote well in taverns or in market-places. Common sense here is inadequate; we must call upon art to explain this thing to the benighted voter. We should build a temple for him, with vestibules and an inner sanctuary, where among statues and pictures, and gorgeous light and color decoration the citizen should deposit his vote. Suffrage should be a solemnity. The voter should rise with the sun, and take an ablution in baths especially built for the purpose; he should array himself in holiday attire, and march in procession with banners and music to the great court where voting is done; he should purify himself in the vestibule with prayer, that this great function be performed honestly and conscientiously; he should present his vote in a respectful attitude, and when the voting was over he and his wife and children should enjoy a dance, or otherwise make some show of thank-

fulness to his country, for being a free citizen, one to whom a voice is allowed in its government. Perhaps men would then feel the importance of the elective franchise.

Common sense is cunning, but not wise. It attempts to govern by strictly adhering to public opinion. Common sense imagines that plain rules of right and wrong, simple, well-known principles will not immediately satisfy the public, because just measures, so framed as to reach the defects of a state as well as of an individual, need time to prove their efficacy.

The modern statesman and politician cannot afford time. He depends upon popularity, and his popularity in turn depends upon immediate recognition of his merit. Hence he yields to popular prejudices, and often resorts to the agitation of erroneous views on questions of policy and political economy, in order to raise in the shortest possible time a party which will sustain him. This is a singular phenomenon in the world of thought. The men who eminently understand the right of the thing, abandon this right to make room for the wrong of it, because the people imagine this to be the right. The people, on the other hand, who directly or indirectly selected these wise men to legislate for them, have not sufficient confidence in their wisdom to admit the justice of a measure when they themselves do not understand the nature of it, while at the same time it is recognized that the subject is not one upon which they as a mass are correctly informed. The passage of the silver bill in America is an instance of this kind. This is a law by which it is ordained that there shall be two units of

measure, each of which shall be called a dollar, while the intrinsic value of one is eighty-five one hundredths of that of the other. This law was passed by a two-thirds vote over the veto of the President, by a Congress the majority of which must have been sufficiently informed to know that there cannot be in anything two standards of measure; the virtue of a measure by which value is estimated is in its being a unit, or else it is not a measure at all. When the mover of this bill was remonstrated with by a delegation of bankers, he declined to consider the arguments of those gentlemen, for the reason that if this law was not passed his constituents would next year send men to Congress who would wipe out the national debt as with a sponge. No greater depth of human ignorance and intellectual perversity can well be conceived than that which is expressed in this speech: "Wipe out the national debt as with a sponge." As if a debt could be wiped out, or as though the repudiation of a debt could in any way modify the condition of indebtedness except to make it worse than it was. If a nation declines to pay its debts, it only charges itself with an evil far greater than the debt itself.

In the streets and public places, in the halls of justice, in parliament, in schools and in churches, the poetry of human relations is daily reduced to an imagined equality. Personal whims and desires decide all questions without help from without. Spontaneous knowledge is made a summary judgment of the aspect and form of things, of men, and of congregations of men as they present themselves in their relations to us, to each other, and to the world. These forms are capable of poetic development, but com-

mon sense has condemned this as superfluous and untruthful, and yet we need it at every step, to help us in our judgment. When men congregate in our parliament houses in clothes suited to monkeys, and sit with stovepipe hats on, or lounge in attitudes of indifference; when, in their debates, they abuse each other, and in their bearing offend common decency; in other words, when the instruction which should be derived from artistic grouping is neglected, and the face of society is deprived of that expression which should betray its inner life—its virtue, its ideas, its morality—then men must lose respect for wisdom and bow to folly.

The man of common sense, however, reflects upon what he perceives through his senses; he draws conclusions rashly, no doubt, and with bad results; but we have at least a mental effort, an honest intention, which we must respect if we do not admit it to be of value, and which we must recognize, even if we deprecate the feebleness and fallacy of its results. But consider the man of taste, who sits in judgment upon ideas of which he has never heard, and of their expression in art, which he has never studied! Think of a man pronouncing upon the beauty of anything while he himself wears a starched shirt-front, a cylindrical hat, mutton-chop whiskers, and pantaloons striped horizontally! In the great cities of Europe sad compounds called plays —without plots, without sentiment, without meaning —are played to full houses for hundreds of nights in succession, and yet the persons who visit these performances speak with confidence of their taste! Men live in houses built of small hemlock joists nailed together in the most slovenly manner, filled in with thin

brick, and faced on the outside with a weak lining of sandstone overtopped with a tin cornice painted in imitation of stone, and insist that they are men of taste! The bookstalls and street corners are crowded with the purchasers of the cheap novel, while the average daily attendance of the great libraries does not exceed a few persons. The literature consumed by the masses is the veriest trash, and yet each one who reads it believes himself or herself a man or woman of taste. While in large cities like London, Paris, New York, and Vienna, a few enterprising men or firms are engaged in producing well-designed furniture, carpets, curtains, and household articles, and find a scanty sale for them, huge factories turn out constantly vast masses of stuff badly conceived, worse designed, and recklessly put together. Ask what becomes of these miserable productions, and you are told that they are sold to the people. When remonstrated with upon the bad judgment displayed in these manufactures—their staring ugliness, violent colors, crude and pernicious ornament —the dealers inform you that they are well aware of these defects, and that they have repeatedly tried to modify them, but have failed to find purchasers for better things; these things are made for and satisfy the *taste* of the people.

What we call the civilized world may be said to do all things in accordance with the fashion of the day. We build our houses, we clothe ourselves, in the fashion. We read fashionable literature, and see fashionable plays. We are pious and vicious in obedience to fashion. We live, eat and drink, marry and are given in marriage, travel, enjoy ourselves, and worship God, after the same manner.

What does all this mean, and what is its import? There is no mystery in this. We all know and understand the nature of it. We prefer the *form*, the expression of a function of any kind, as it is ordered to-day, not by an authority which we respect, or one for which we have an affection, but by men and causes which we despise. We do this with the full knowledge and understanding that next year we will do precisely the opposite with the same ardor and the same satisfaction. We are obtuse enough to boast that we are a people of *taste*, able to distinguish the beautiful from the ugly; yet every year we go into ecstasies over the beauties of the prevailing fashion. We laugh at the unfortunate mortal who lacks the *taste* to change his last year's coat, his superannuated carriage, his unfashionable furniture, etc., etc., all of which, awhile ago, we extolled to the skies as admirable specimens of human art. Can it be possible that in so doing we display a sound judgment of form, color, adaptation, expression, etc.? or are we merely the shuttlecocks of our imagination, which has become impotent unless excited by the judgment or example of others?

The radical error at the foundation of all this is the attempt to explain the nature of beauty by its symptom, "a pleasurable emotion."

It is said that a work of nature or of art which has beauty excites a pleasurable emotion; this is not always true, for there are many who *hate* good music, architecture, sculpture, painting, and literature. But to test this assertion, let us grant that an ordinary person would rather suffer the infliction of a good opera than be left to his own thoughts for an evening, does that prove anything? A game of cards with a dull

companion would be preferred, perhaps, and then there is much in the performance of an opera outside of its music which is attractive and diverting, although it is either an inferior art effort or entirely a thing not art at all. But the converse of this definition—the assertion that a pleasurable emotion is the proof of the presence of beauty in anything, is simply preposterous, and leads men into extravagancies which are inconsistent with sanity.

An immense amount of human labor is expended annually on productions which derive their greatest percentage of value from so-called art. If this is art which changes with the fashion, if it is mistaken art, bad art, all the labor expended on it is a total loss. Why is it created at all? Because there are men of taste who think it beautiful long enough to purchase it, only in order to throw it away next month or next year. The money (which means labor) expended in ten years for bad architecture, bad sculpture, bad furniture, bad paintings, bad literature, bad music, and other *bad* art, would amply pay for all *good* art works which have been created since the beginning of history.

We have liberty of speech now, at least outside of Russia, and it is a good and glorious thing that man should have the right to speak, write, and print without fear, whatever his thoughts may be upon any subject of interest to man. But humanity is a society wherein heretofore only a favored few have been permitted to talk in public, and this privilege has been extended to all only recently. One would think naturally that man would be modest in making use of this great privilege of addressing the world, that he

would hesitate to say anything unless he had first made sure that he had something to say which was of value to his fellow-men ; and so he would, indeed, had not some demon whispered in his ear that he possessed *common sense* and *taste*, and that the majority of humanity looks upon these gifts of nature as an inexhaustible treasure that will take the place of *knowledge*. In fact, the less a man knows, the greater his opinion of his common sense and taste.

What does all this talk about common sense and taste amount to? Simply that man can see, and hear, and feel, and smell, and that whenever he exerts any of these senses upon the matter which surrounds him an impression is made upon his mind. Now, the great infelicity in all this is, that the man of common sense and taste imagines that this mental impression is a *facsimile* of matter and motion which he has perceived with his senses, and that he can intelligently compare it with other matter seen or heard that also has left an impression on his mind. This is unfortunately not true. Take, for example, the simplest article of wearing apparel, a boot, or a glove, a thing all of us are in the habit of handling and examining daily; a chair, a table, a dinner-plate, a carriage, a railroad train. How many men are there who can make a drawing of either of these things, or who can give a lucid description of the material they are composed of, how this material is manufactured, how put together, by what means, and with what amount of labor,—when and how any or all these things are good, bad, or indifferent for the purpose used, or what is their intrinsic value? Very few men indeed know anything whatever of these things.

If we were to tell the average man that his common sense is insufficient to guide him in purchasing, selling, or using any of these commodities, he would think himself insulted.

But when we come to matters of art and of nature we find men still more profoundly ignorant; yet no one hesitates at a critical opinion on any work of art, unless indeed he is considerably advanced in his knowledge of what art really is. "I know when I like a thing and what I like suits my *taste;* and although I may not have as much or as cultivated a taste as my neighbor, the little I have is as good as that of any other person. My wife is a milliner, and I ought to have taste enough to judge of a painting or a statue; my grandfather was a builder, and a taste for architecture runs in the family; my great-uncle frequently expressed his approval of Shakespeare and Milton, and I should think I know something of literature." This is the popular talk on taste.

Men who never saw or heard of a good architectural monument boldly ask reputable architects to submit for their approval designs for churches, libraries, museums, and court-houses, because their associates in some building interest, who professedly know less of the subject than they do, have selected them for that purpose as men of *taste.* The very fact that these men are willing to sit in judgment on a series of architectural designs, and rest their interests, or the interests of others upon their decision in an art matter, which, to understand clearly, demands the study of a life, shows conclusively that these men are profoundly ignorant of the subject.

It is the privilege of man to ask of nature any ques-

tion whatever, and she will answer him truly, unlike the sibyl, not in words, but, like the sibyl, with an enigma. This enigma may be read in matter, in the matter which composes this great universe, including all its combinations, relations, motions, and organisms, not only arranged by nature herself, but also as re-created by man in imitation of her works in organisms known as art productions.

See, and hear, and feel, says nature to man, and you may read all things, and whenever matter is thus addressed it permits itself to be read. For thousands of years mankind has been occupied in reading and re-reading this wonderful volume of nature and art, and there can be no doubt that as long as man lives upon the face of this earth he will continue to read it with interest and profit to himself.

As to individual man, he reads but indifferently well, unfortunately always with the same fluency; what he has read is clear, intelligible, and complete to him; he thinks that he can understand it all, because all he can read, and hear, and see in it he understands *as he sees, and hears, and feels it*, no better and no worse. If perchance in time he learns to see better, he will read better, and he is elated by his progress, and thinks not of his former or his present shortcomings.

A flower and the Iliad, a work of nature and a work of art, may be known to a thousand persons, and each will express unbounded admiration for the beauty of both; yet if the conception of them, as formed by each individual, could be weighed in a balance, we should find a thousand different values attached to each. You say you have read Homer when a youth, and that the book has been your constant companion during

manhood and old age; that you have examined the organism of that flower, and analyzed it chemically and with the microscope. Yet yon simple girl plucks a rose because she loves it; she dreamily turns the leaves of your Homer, and extracts from it what she there finds beautiful. Let us not decide which of you two has been made happier by either; but if at any time I should long to learn of poetry and flowers, I shall sit at your feet to do so.

CHAPTER II.

THE AIM OF ARCHITECTURE.

Science, common sense, and taste supply the world with knowledge. Let us see how art, and more especially architecture, is thriving with the help of this knowledge. In order to form a correct view of the condition of architecture, it will be well to examine its great aim at the present day, to create a new style.

The present condition of architecture may be inferred from the question constantly asked, "Will the civilized world, England, America, France, or any other civilized country, ever have a new style of architecture?" There is no indication that this question was ever asked by the Egyptians, Greeks, and Romans, or by the nations of Europe during the Middle Ages; nor are the Chinese, Japanese, and Persians interested in it at the present day; it is eminently the concern of the so-called civilized world and of the nineteenth century.

If architecture as an art were complete, or if it ever had been perfect at any one time, that is to say, if all the demands now made upon it could be fully supplied by past experience, or if we could find in any one period of its history an answer to every current æsthetic question, there would be no need of progress

in architecture; new styles would arise from time to time as society changed its needs and nature, and as human ingenuity multiplied its material; we should then see springing up around us buildings of a character entirely new in expression, representing the many new ideas and wants of civilized society made possible by modern science, and called forth by political, social, and religious changes, and by a vast increase in the best building material. We should be overwhelmed with new architectural forms and combinations, and have not only a new style of architecture, but a constantly growing and changing style. Indeed the *various* styles of the present century would be spoken of with confidence and approval. The present activity in building has no parallel in the history of the world. The complexity of modern society demands more various buildings than are furnished by any past period of architecture, or by all past periods put together, and the conditions which govern erections vary constantly from those which preceded them. What state of things ever seemed more forcibly to compel a new style in architecture than that in which we live?

And yet, though monuments are built of new materials, in new places, to answer new and heretofore unknown purposes, they merely repeat, when they do not caricature, past architecture, and we call in vain for a new style. A new style, it is evident, will not come simply because it is called for, or hoped for. Architects think of it and dream of it; attempt it and fail; and finally, in despair, change their designs from one style to another, vaguely hoping to stumble upon one that contains all the elements they need, in the combination in which they need them.

As we know of no such struggles in the past, we come to the conclusion that architecture is dead, and that we can do no more than to dig up its varied forms from the past and apply them to the need of the present. The question then becomes, What forms are we to take, Egyptian, or Greek, or Roman, or Mediæval? The current answer to this question is, Take them all, familiarize yourself with them all; but when you reproduce them, be careful to keep them separate, and to use only such as were originally used together, lest by mixing forms of different periods you produce discord.

And thus the student reads the history of architecture, and if he is very clever and industrious he dives deep into archæology. Give him a section of a label moulding, or of an abacus, and he will reconstruct the building for you from which it is taken. His mind is a museum of architectural history, and architecture becomes to him a knowledge of forms, connected with dates and places, but not quite clearly with the ideas which have given them existence. He finds that these forms harmonize best in the relation in which they are placed by their authors; and in order to preserve the harmony and unity of works of architectural art as they appear in the past, he copies them in the exact relation in which he finds them. Hence mere division into styles no longer affords a well-arranged index of art. It becomes necessary to divide and subdivide styles, until there are as many types almost as there are individual monuments, and when the problem of designing a new structure is met face to face, and it is found that its requirements do not agree with those of any monument erected at least five hundred years ago,

the architect becomes indignant at modern wants, and declares them to be outside the pale of architectural art.

Mr. Ruskin, in his introduction to the Seven Lamps of Architecture, says: "What is true of human polity seems to me not less so of the distinctively political art of architecture. I have long felt convinced of the necessity, in order to its progress, of some determined effort to extricate from the confused mass of partial traditions and dogmata with which it has become encumbered during imperfect or restricted practice, those large principles of right which are applicable to every stage and style of it. Uniting the technical and imaginative elements as essentially as humanity does soul and body, it shows the same infirmly balanced liability to the prevalence of the lower part over the higher, to the interference of the constructive with the purity and simplicity of the reflective element. This tendency, like every other form of materialism, is increasing with the advance of the age; and the only laws which resist it, based upon partial precedents and already treated with disrespect as decrepit, if not with defiance as tyrannical, are evidently inapplicable to the new forms and functions of the art which the necessities of the day demand. How many these necessities may become cannot be conjectured; they rise, strange and impatient, out of every modern shadow of change. How far it may be possible to meet them without a sacrifice of the essential character of architectural art, cannot be determined by specific calculation or observance. There is no law, no principle based upon past practice, which may not be overthrown in a moment by the arising of a new condition, or the in-

vention of a new material; and the most rational, if not the only mode of averting the danger of an utter dissolution of all that is systematic and consistent in our practice, or of ancient authority in our judgment, is to cease for a little while our endeavors to deal with the multiplying host of abuses, restraints, or requirements; and endeavor to determine, as the guides of every effort, some constant, general and irrefragable laws of right —laws which, based upon man's nature, not upon his knowledge, may possess so far the unchangeableness of the one, as that neither the increase nor imperfection of the other may be able to assault or invalidate them."

"The necessities of the day, as they arise in multitudes not to be conjectured, strange and impatient, out of every modern shadow of change, new conditions and the invention of new material, threaten to overthrow in a moment the *laws* and *principles* of past practice."

A reflective mind would inquire at this stage of the argument—do I know the laws and principles of past practice? If I do know those laws, how is it that they can be overthrown in a moment by modern conditions and materials? Laws are eternal, if *true;* if not eternal, they are *false*, not laws at all. Wherein am I misled in my judgment?

A frank inquiry of this kind might have led the author to the conclusion that the laws and principles of past practice are either not known to him, or that the laws and principles of past practice are erroneous laws.

The truth is, that the author was not thinking of laws, but of forms, the result of laws, and of certain

relations of forms which have been rashly assumed to be laws. It is upon forms that his imagination dwells, upon the outward and visible results of laws at which he has not arrived, and it is to these forms that he recurs throughout the book. These forms Mr. Ruskin recommends for various reasons, very few of which have any relation to principles, and his attempts to refer his personal preferences to abiding and universal laws are uniformly unsuccessful, while the laws which he invents to justify his preferences are usually even more whimsical and fanciful than the preferences they are invented to justify. Many of these forms he praises because he is unfamiliar with better forms of a similar kind, and imperfect forms therefore seem perfect to him; and not a few because they have left on his mind a foggy picture, which, had he analyzed it, would have satisfied him less. His illustrations exhibit this same vagueness; they are not representations, but uncertain impressions only, of the things he saw.

If writers upon the theory of architecture thus fail to survey the whole field, with the view of deriving from all periods and schools of architecture the laws which underlie and generate their forms, it is not to be expected that more than a small minority of practicing architects, or of students whose studies are to result in practice, should undertake the examination of architectural forms. The great majority, eager to become practitioners and to make a living, and appalled at the labor which a study of architecture involves, confine themselves to forms of a particular period, devote themselves to a specialty, and study only a style.

Greek forms, for various reasons, have the greatest number of votaries. Perhaps laziness, moral laziness, may be the chief of these reasons, considering that Greek forms are eminently simple and have been carefully sorted, measured, and labeled by various authors. Besides, the young architect, upon entering the temple of art from the back door of history, finds them stored near that entrance, and with the ardor of youth he revels in them for a while, and soon begins to think that they alone are sufficient for all purposes of active work.

At the beginning of this century this was the universal condition of the profession. The land was flooded with Greek temples. We had Greek temples for churches, school-houses, libraries, courts of justice, custom-houses, exchanges, post-offices, colleges, theaters, and beer-shops—all Greek temples alike. There were large and small temples, temples of brick and of wood, of stone and of plaster.

Roman, Renaissance, and Mediæval forms have in turn been brought into requisition, with very nearly the same artistic result. We say nearly, because Mediæval art contains examples of many kinds of buildings which are still needed in our times, and our architects were not put to the necessity of projecting cathedrals to answer the purposes of mercantile, social, educational, and other structures, in the same manner in which the Greek and Roman temple was called upon to do duty by our predecessors at the beginning of this century.

The profession has become divided upon this question of styles. The majority practices classic architecture, or its modern resultant, the Renaissance; a

minority devotes itself to Mediæval art. There is also a class which, hanging on the outskirts of these two great divisions, professes to be eclectic in its convictions, and flits from one style to another as outward circumstances or inward promptings may incline it.

At one time, not long ago, the two great parties in architecture, viz., the Mediæval and the Renaissance architects, were arrayed in hostile camps, and carried on a war of words in defense of their respective styles. The Mediævalists urged that Antique architecture contained a limited series of forms, which, based upon the simple ideas of a polytheistic mythology, and confined to the primitive Greek and Roman methods of construction, are inadequate to express the complicated ideas of the present time, and that Romanesque and Gothic architecture did contain forms of greater variety, in fact, covered the whole ground of known methods of construction and material, and ranged the realm of decoration without restraint of any kind. In consequence of all this, Mediæval architecture, they thought, should be adopted as the architecture of the day; and if its forms, as we find them, do not express modern thought, or if they do express ideas which we have now abandoned, we should still adopt Mediæval architecture as the starting point of a new school, and develop upon this basis a new architecture of our own. This reasonable argument was rejected by the Renaissance party. Gothic architecture to it expressed nothing but superstition, oppression, and ignorance; it was rude and brutal, fantastic and trifling in character, complicated and restless in detail, and could not in any manner compare with the grand simplicity of the Antique. If any basis of progress in architecture was

to be adopted, the Renaissance was the proper point of departure, and from it should be developed the architecture of the future.

These arguments, in turn, could not have failed to convince the community at large, and would have inevitably silenced the Mediæval party had the Renaissance school developed Antique art according to promise; nor would the Renaissance party have continued this useless war had the Mediæval party in the mean time changed Gothic forms and adjusted them more nearly to modern feeling.

Like most wars, this ended in exhaustion on both sides; both lost much of the respect of the community and diminished the opportunities of professional employment. The sinews of war gave out. A truce was established on the basis of a division of the possible spoils, with a semblance of mutual respect and reconciliation.

Before the public, the parties admitted both Antique and Mediæval architecture to be respectable systems of art, each fully capable of expressing ideas; confessed that ideas are at best somewhat unsettled at present, that methods of construction may be conveniently concealed if they cannot be expressed, and that the selection of architectural forms is very much a matter of *taste*.

In private, old arguments are rehearsed, and if they convince no one, they hurt no one's feelings, being confined to small circles in which the members are of one mind.

And so both parties continue to use old forms for modern purposes, and both fail in doing so. Each party clearly sees the failure of the other, and ascribes

it to the style adopted as the basis of operations, and neither advances beyond the starting point.

It would be unjust to the profession not to remember some good results of this lamentable condition of things, viz., the archæological work in the excavations of Antique, and the active and successful restoration and completion of Mediæval monuments.

Nevertheless architecture to-day is practically nothing more than a collection of assorted forms, the elements of which are but little considered, and the origin of which is hardly known. When architects speak of progress in architecture, they mean possible new forms which must be *invented* with great labor of the imagination. When old forms are applied, it is done without reference to construction and material. A cornice is supposed to be a sort of architectural decoration, and not a stone covering a wall, hence wooden and zinc cornices, cast iron capitals, gargoyles in places where no water runs, and buttresses where there is no lateral pressure, arches of lath and plaster where there is no abutment, columns which support nothing; balustrades in places where no one can possibly walk, and battlements upon peaceful libraries and school-houses. It is true that a very respectable number of modern architects are never guilty of these gross errors, but how many are there who are willing to forego a tower simply because it is not needed either physically or æsthetically, or a flying buttress, if by an ingenious argument it may be justified?

Architectural forms, like musical compositions, contain but few elements, but these are capable of a great number of combinations. Nor is it necessary that these combinations should be laboriously sought for;

they arise naturally out of the conditions of the structure, out of the idea which has given rise to it, and out of the material used in its construction. They are of value only in expressing all these conditions, and of no art value whatever if brought about in any other away.

The modern architect, for reasons which will hereafter be discussed, but rarely refers an architectural composition to the idea which has given rise to it. He often ignores or neglects the construction and the possibilities of the material employed, as technical matters beneath his notice, but imagines that after a structure has been technically designed, so far as it is necessary to answer its practical purposes, either by some engineer or by himself, *then* the labor of the architect begins by inclosing the structure on the outside and lining it on the inside with a skin of architectural forms gathered from his general fund, in accordance with the dictates of his *taste.*

CHAPTER III.

TASTE.

Taste being the principal motive power which supplies the modern architect with the mental help by which his art work is created, it becomes desirable to define its nature as it is popularly understood.

Taste, in the sense in which it is commonly understood, is a delusion and a snare.

It is supposed to be a species of sixth sense with which nature has endowed man, so that he may understand works of art without analysis, and produce them without reflection. More bad art has been produced and encouraged, and more injury done to good art by this delusion, than by all other adverse causes put together.

People who have no knowledge of art experience a pleasurable emotion in the presence of a work of art, hence it is rashly assumed that these persons possess this sixth sense, *taste*. This would be true were the pleasurable emotion in all cases proportionate in degree to the merits of the work admired, but experience tells us that the reverse is the case—that the majority of men enjoy pleasurable emotions from art works of the lowest degree, and none whatever from art of a high class.

We frequently encounter rugged natures who do

not hesitate to avow that they abominate the opera, hate statuary and architecture, and would not give sixpence for all the paintings in the world; they attend concerts and visit galleries of art from a sense of social duty, but do not conceal it that they are bored in doing so. While one person delights in good literature, thousands read trash with avidity. A monument of architecture may produce an impression, by reason of its magnitude, cost, or novelty, but none of the elements which constitute its merit as a work of art are recognized directly by the multitude.

The mass of bad architecture tolerated and paid for is a practical proof that *taste* is the property of but a few, and it remains to be seen whether it is in any case a natural gift, or the result of study.

Taste is said to be variable, according to the proverb, that "there is no accounting for taste." It would be difficult to persuade men to adopt a variable unit of measure, yet art is saddled with a judge who tries its merits with a yard-stick varying from three feet plus to three feet minus.

Of course this incongruity is more or less apparent, and we hear specious talk of cultivated taste. If taste is perfect in the ratio of its cultivation, then uncultivated taste can be of no value in art.

Architects and laymen during the last two centuries have abhorred the use of color as a means of decoration, everything not painted white or whitewashed, being pronounced ugly, sinful, wicked, and vulgar. This betrays not only the absence of natural taste, but a capability for a negative taste, a universal dislike of what is desirable in art.

The pleasurable emotion produced by art work is

so mixed up with habits and with personal, religious, and social prepossessions, that it becomes unsafe to claim for our likes and dislikes of various forms of art the authority which belongs to a just standard of æsthetic merit. The conditions under which we see works of art, the length of time we pass with them and under their influence, and the opportunities we have had to see other works of similar aim with which to compare them, all have much to do with the judgment we form, and we are not therein assisted by a natural *taste.*

The architecture of Venice, heightened in its picturesque effects by an Italian sky and the ever-present Adriatic, and hallowed by historical reminiscences of the wonderful power and success of a handful of patricians and merchants during several centuries, has left upon the sensitive mind of Mr. Ruskin an indelible impression which dulls his perceptions of the beauties of architectural art outside of Venice, and blinds him to many glaring defects of Venetian architecture itself. Why is he not equitable and just in his judgment, through the mere force of his natural *taste?*

Art history has preserved to us a few isolated examples of architectural art (few compared with the great mass of work, attempted during historic times), the production of a small number of men whose labors have enriched the world, and who appear like bright stars upon a firmament of general darkness. We know of long intervals of inactivity and retrogression in architecture among all nations and more especially in what is called the civilized world. We may say that the good work done in the best of times

is but a small percentage of the whole of the work attempted, and that during whole centuries no good work whatever has been done in countries like France, England, Germany, Spain, and Italy. Why has the sixth sense lain dormant during all these centuries, if *taste* is inherent in the human mind?

Think of the period of Louis XIV., the Rococo of the European continent, the palaces of the great built in forms so vile and unmeaning that we regret the tardiness of time and the elements in not wiping them off the face of the earth. There they stand, living witnesses of the ignorance and folly of the architects who designed them, monuments of the depravity of the generation which approved and admired them, and of living multitudes who still accept them as works of art. Are we warranted in assuming that the architects of the Rococo and their public were endowed with *taste?* And yet all Europe thought so in their time.

Look at the condition of architecture at the beginning of the present century; look at what passes for architecture with the multitude to-day, the cardboard Gothicism of our churches, the vulgarity and pretension of our dwellings, the stage effects of public buildings generally. Do we not know that nine-tenths, aye, ninety-nine in a hundred of all these structures, put up by so-called architects, architects of reputation, and schools of architects, and admired by their patrons and the public, are of *no* value as works of art? Does this show the existence of natural *taste?*

Progress in science is greater or less at times, but its truths constantly accumulate, and mankind enjoys at all times the sum of all truths hitherto at-

tained; the architect wilfully abandons the experience of centuries, not because he denies its value, but because he dislikes the use made of this experience by others. The forms to which it led do not suit his taste, and his *taste* is paramount with him; it takes the place of reasoning, of study, of knowledge, of judgment, of facts, of ideas, of everything which is a motive of action with other men; and it is his *taste* which has done more injury to architecture than any or all other causes combined.

The young student of architecture very soon discovers that he is possessed of much *taste;* in fact, his parents remember, with interest, that he has been so gifted from his childhood. His *taste* prompts him to attempt composition at a very early stage of his education. Mathematical study, reading of any kind, is not as pleasurable as the exercise of his *taste* in drawing sketches of possible buildings. To draw carefully existing monuments is hard work, as is well known to the pupils of the European academies, where this is the constant practice; but to make sketches, to compose, is a pleasure most pupils affect.

In this way a few years devoted to the study of architecture flit by, and the only thing certain is that the student has not mastered mathematics, mechanics, and construction, but is very fond of making original sketches, and he brings to the practice of his vocation a profound conviction that he is a man of prodigious *taste;* that taste for art and taste for dry science never are joined in one individual, and that his inspirations will carry him to a pinnacle of fame which cannot be reached by mere drudgery.

The moment he is called upon to do real work he

proceeds to develop a full-fledged composition out of his inner consciousness.

There he sits over a virgin sheet of paper with a black, soft pencil ready in hand to catch the visions as they fly. Does he think of the needs of his client, of the ideas which are to be represented in his monument, of the emotions which will pervade its future occupants, of the groups which they will form under the influence of these emotions, of the spaces required to house these groups, of their physical and poetical relations, of the methods of construction adequate to the nature of the ideas to be developed which are to lead to architectural forms, of the material which he is to use, and of the forms it must assume in the structure? No; he thinks of none of these. He thinks of himself, of what a fine opportunity this is to build a magnificent structure; he thinks of the many lovely things he can combine to erect a wonderful monument. He has visions, while he chews his pencil—visions of dreamy phantoms, such as we all have from time to time, of things we do not positively know, things we have never analyzed, things which spring up in our brain full-fledged but foggy, of uncertain and changing outline, growing in seconds of time to great masses of uncertain elements, pulpy clouds, with spangled points here and there of more definite shape, but changing all the time and evading our grasp while we attempt to give them definite expression. During hours of dreaming a succession of woolly sketches is made which are satisfactory in proportion as they are indefinite, and which are promptly rejected the moment they assume shape. There is finally something produced which, when artistically shaded or colored,

pleases the author amazingly, but which has nothing whatever to do with the subject in hand.

The architectural critic lives upon the same stock in trade, *taste*, without the necessity of creating anything by virtue of it. The architectural critic sits upon the judicial bench and consults his oracle, his *taste*, and tells the public that this is bad, the other good; this small, the other large; this strong, the other weak; for no other reason than that it so seems to him by virtue of his *taste*.

CHAPTER IV.

ARCHITECTURE.

The reason why architects, critics and the public talk so much of taste, style and forms, and so little of architecture, is to be found in the prevailing uncertainty as to the nature of architectural art. Ruskin defines "architecture to be the art which so disposes and adorns the edifices raised by man, for whatsoever uses, that the sight of them contribute to his mental health, power and pleasure."

It seems from this that Mr. Ruskin conceives a building and its architecture to be separable, and to make this point clear he further says: "It is very necessary, in the outset of all inquiry, to distinguish carefully between architecture and building;" and again, "Let us therefore at once confine the name (of architecture) to that art which, taking up and admitting as conditions of its working the necessities and common uses of the building, impresses on its form certain characters venerable and beautiful, but otherwise *unnecessary*."

The characteristics of architectural work are now enriched by another definition, which is that this work is in itself unnecessary; but, as we are distinctly told above, that architecture adorns the edifices, to the end that the sight of them shall contribute to the mental health and power of man, a function which is not to be

designated as unnecessary, we must conclude that the author means that these architectural features are unnecessary to a sound technical condition of the building, or to the convenience of the human beings who are to occupy it.

Not to leave us in doubt on this subject, the author proceeds as follows: "I suppose no one would call the laws architectural which determine the height of a breastwork, or the position of a bastion, but if to the stone facing of that bastion be added an unnecessary feature, such as a cable moulding, *that* is architecture."

The reflections called up in our minds upon reading all this, may be stated as follows: If Salisbury Cathedral, for example, were stripped of every statue, ornament and moulding which now adorns it, of everything "unnecessary" to the stability of the cathedral as a building, would not the naked structure which remained still tell the story of a Christian idea and of the emotions of men imbued with that idea; and would it not thus continue to contribute to the mental health, power and pleasure of the beholder, and remain a work of architectural art?

If, on the other hand, the walls of a theatre were adorned with bas-reliefs, sculptures and paintings representing the Flight of the Holy Family, the Crucifixion, the Battle of Bunker Hill, and the Resignation of Washington,—all subjects a contemplation of which contributes to the mental health, power and pleasure of the beholder,—would this system of decoration convert the building to which it was applied into a work of architectural art?

It is only upon the theory that architectural art is merely a method of decorating a building by paintings,

and by bas-reliefs and other sculpture, and that it has no relation to the construction or the modelling of the masses or their arrangement, that we can appreciate Mr. Ruskin's advice to architects to become sculptors and painters.

This is no more true than that the beauty of a woman depends upon dress, jewelry and false hair.

A building may be covered with sculpture and color decoration, both intrinsically good, but these may ruin it as an architectural work, simply because neither sculptors nor painters are architects, and hence may have been unconscious of the nature and functions of the various masses to be decorated. For example, curved arabesques or vines running on the soffit of an arch or capping, either in bas-relief or painting, would destroy the apparent rigidity of the work and would detract from its repose. The function of the arch is the first consideration. When the arch is decorated its apparent stability should be enhanced by the method of the decorator; if it is not so enhanced, then the architecture would be much better without it. A series of statues succeeding each other in the jamb and arch of an opening, the topmost statue being placed at such an angle as to make it certain that its stability depends upon something outside of itself, as we frequently find in the best cathedrals, is an artistic defect which cannot be atoned for by the presence of the best sculpture. Canova's statues on the pinnacles of the cathedral of Milan, and the reclining figures in the spandrils of St. Peter's at Rome, are also instances of this kind. When we are further told by Mr. Ruskin that it is proper to indulge in erections which perform no functions as parts of an architectural monument,

merely to afford an opportunity for abundant decoration and sculpture, we must conclude that Mr. Ruskin loves decoration and sculpture, related or not to the ideas on which the architectural monument is founded, and though we may pardon his enthusiasm, we cannot accept his ideas of architectural art as sound. Mr. Ruskin has said and written much on art, and has aroused an interest for it in the community which cannot fail to be beneficial; and if we find it necessary to question his definitions and logic, it is done to show errors relating to architecture as they exist in leading minds, rather than to speak of them as mere popular prejudices.

Professor William Hosking writes upon the elements of beauty in architecture as follows: "Harmony, concord, or fitness of proportions of form of one part of a composition to another, and in the collocation of the various enrichments which architecture requires, is as necessary to its beauty as simplicity. We do not speak of the agreement which should exist between the manner or character of a structure and its application, for that is purely conventional, and totally independent of any architectural consideration. The merit or demerit of a composition is not at all affected by the use to which the edifice is applied; neither would its front be more tolerable, nor its cupola less beautiful if St. Peter's in Rome were by the course of events to become a democratic forum instead of a Papal basilica; nor is the Monument of London a more or less elegant object, whether it be understood to record a triumph or a defeat, the burning of the city or its re-edification."

Here is the avowal of an eminent authority on

architecture, writing in the eighth edition of the *Encyclopædia Britannica*, that "The merit or demerit of a composition is not at all affected by the use to which the edifice is applied."

Use, then, is entirely conventional and totally independent of architectural considerations. *Ergo*, conventional forms of architecture are not the result of ideas. When the monument is to be designed, the architect may require to know how large it is to be and what is to be its cost, but nothing of its uses and purposes. That we may have no doubt of the emptiness of this writer's mind on the subject, we are further informed in another part of this same article relating to the "Principles of Architectural Composition," "that these (principles) must be different in the widely different species of architecture whose tendencies in the one are to horizontal or depressed, and in the other to vertical or upright lines and forms."

Here, again, it is assumed that the principles of one and the same art may differ according to circumstances. Principles, however, are fixed and eternal. The same principles which established horizontal lines in Greek architecture, as the natural outcome of a construction based on the use of the lintel, also determine the perpendicular lines in mediæval architecture, through which clere-stories light an edifice containing a vast congregation, and through which buttresses sustain the system of interior arching resulting from this form and from advanced methods of construction. When forms are thus confounded with principles or laws, we are not surprised to see it stated further on under the head of "Vertical Composition," that "buttresses in a pointed composition must not be considered simply as

abutments to the arches and aids to the walls of a structure, any more than a cornice in horizontal composition may be thought only necessary to cover or protect the wall on which it rests." "That these *were* the purposes for which they were severally applied originally, cannot be doubted; but although such may be their purposes we must now consider them as aids to architectural effect. Buttresses, then, are of the same use in the vertical style that cornices are in the horizontal, to give character to an elevation by throwing a mass of shadow, to relieve it of the monotony necessarily attendant on a flat surface, however it may be pierced or enriched."

When architects come to believe that the fundamental idea of the monument they are designing needs not to be considered in the composition, and that members which were devised to supply a need and answer a purpose, may be introduced needlessly and purposelessly, because their forms appeal to the taste of architects, then indeed architecture as an art is dead, and we need not expect new conditions, new materials, or new ideas to give rise in our structures to a new art expression.

Mr. Fergusson, in the introduction to his history of architecture, speaking of architecture as an art, and defining its position among the sister arts, concludes that a building can tell no story, and that it can express an emotion only by inference. If this were really true, then architecture would not be a fine art in any sense of the word. He also says: "That in none of its stages is imitation an element of architectural composition. No true building ever was designed to look like anything in either the animal, vegetable or mineral king-

doms. In all instances it is essentially a creation of man's mind, and designed to subserve some practical purpose which he has in view."

The author is evidently aware that imitation is an element in art, but he confounds imitation of the methods of nature with reproduction of the forms of nature. A work of art, like a work of nature, is a realized idea, and the ideal is the essence of architecture. It is the godlike attempt to create a new organism, which, because it is new, cannot be an imitation of any work of nature, and, because it is an organism, must be developed according to the methods of nature. It is this fact which places architecture, in its aim at least, above all other arts. If a building can express no idea, as ideas are expressed in the works and through the laws of nature, then architecture never was an art.

It would be a waste of time here to enumerate the popular errors as to the nature and function of architecture, or to enlarge upon those of professional architects and writers on this subject. It is enough to show that leading architectural minds who are habitually quoted as authorities on the philosophy of the art, look upon an architectural monument, not as the logical expression of an idea, but as an accidental make-shift to supply certain physical needs, which, subsequent to its creation is to be in some way adorned. This adornment again is not considered as an integral element of the structure, but as a thing which shall somehow please the public, either by furnishing artificial shadows to cover inherent nakedness, or by introducing extraneous art-work, which by its nature shall, independently of the structure, produce art-effects which the structure

itself is not capable of doing, or in the doing of which it can take no other part than that of the frame of a painting.

To sum it all up, it appears to be the accepted opinion that the sole function of architecture as an art is to make monuments pleasant to behold; that this may be done in any way which to the author of the monument may promise good results; that it is useless to seek for a clue to all this in the organism of the monument itself, or in the nature of the idea which has called it into existence, or to seek to establish an organic relation between the ornament and the structure. The forms of past architecture are valued in the degree in which they please individual authors; their function and meaning are unknown, and where known they are disregarded. New forms are looked forward to which shall be the offspring of the mind or of the imagination. Their conditions also are not that of an expression of certain mechanical work performed which connects the material with the ideal, with a system, a principle, or a law, but they result simply from the dictum of the author's taste. What must become of the value of this taste when all thought bearing upon the subject is rejected as extraneous may be readily imagined, and its results may be observed in the work of the last four centuries. That such a looseness in the definition of the nature of architecture must lead to false conceptions of its characteristics and to other illogical reasoning must be apparent, but will be more circumstantially illustrated in the next chapter.

CHAPTER V.

ILLOGICAL REASONING.

Another prejudice or notion entertained by the public, as well as by the profession, is the belief that architecture is the result of certain proportions of length, breadth and height based upon certain cabalistic numbers, or illustrated by geometrical diagrams and figures, such as triangles, squares, circles, etc.

Greek philosophy has left us an inheritance of this kind. At one time the vagueness of this belief pervaded all science and art, forming the stock in trade of empirics, who dealt in mystery for the only purpose for which mystery is of use, namely, to cover up and conceal defective reasoning.

Vitruvius speculates numerically both on the parts and on the whole of the perfect man, deducing from numerical relationships the rash conclusion that the proportions of the parts of the human frame, or similar proportions, must likewise constitute the true proportions of the parts of a perfect structure. He begs the question by appealing to our veneration of the Deity who has made the perfect man, and he argues our obligation to imitate nature in our monuments. He gives us no clue to the rationale of these numerical relations in the perfect man, nor in architectural structures, nor to their correlation, but simply insists upon

the virtue of numerical relations in general, and refers us at once to the proportions of the Greek temples, which he fails to state correctly, for the simple reason that he never examined them.

To expose the fallacy of this and similar statements, their logical errors, their speciousness and their evil effects upon the mind of the young and inexperienced, would involve more time and space than can be well given to it here, and more than the subject deserves.

If it were true that all parts of the human body could be expressed in tenths of the whole, without any additional fraction of a tenth, this would, after all, only refer to the relations of the parts to the whole in what Vitruvius designates as the perfect man. If this perfection relates to physical development, and the man thus proportioned is the athlete of the Greeks or the gladiator of the Romans, the proportions of noble senators, learned philosophers, priests and kings, must differ materially from those of the merely well-made human animal; and as natural beauty and a degree of spiritual expression far beyond that of the athlete cannot be denied to these classes of men, it follows that no standard of human form can be established as absolute in art.

This is also true as to architectural monuments. No two species, no two individual monuments of the same species, emanate from conditions so exactly alike as to make imperative the same expressions of strength or elegance or refinement. Hence no law of proportions can be established for more than one structure. This law of proportions means, if it means anything, that an architectural monument, like all matter, has form, which form is a relation of parts, (proportion); the variety

of proportion, however, is endless, and dependent upon an equally endless variety of physical and ideal conditions, to say nothing of the ability of the architect to attain the expression resulting therefrom.

We find in Fergusson's "Hand-Book of Architecture" the following statement illustrating the necessity of stated proportions in monuments:

"To take first the simplest form of the proportion: let us suppose a room built which shall be an exact cube, of say twenty feet each way,—such a proportion must be bad and inartistic, and besides the height is too great for the other dimensions, apparently because it is impossible to get far enough away to embrace the whole wall at one view, or to see even the commencement of the roof without throwing the head back and looking upwards. If the height were exaggerated to thirty or forty feet, the disproportion would be so striking that no art could render it agreeable. As a general rule, a room square in plan is never pleasing. It is always better that one side should be longer than the other, so as to give a little variety to the design. One and a half the width has often been recommended, and with every increase of length an increase of height is not only allowable, but indispensable. Some such rule as the following seems to meet most cases. The height of the room ought to be equal to half its width, plus the square root of its length,—thus a room twenty feet square, ought to have between fourteen and fifteen feet height; if its length be increased to forty feet, its height must be at least sixteen and a half feet; if one hundred, certainly not less than twenty feet."

It will be noticed that the phrases "must be *bad*,"

"no art could render it *agreeable*," "is never *pleasing*," all have reference to that great arbiter, the *taste* of the author. The assertions are presented as axioms; no valid reason is given to demonstrate their truth.

The statement is made that the proportions of a room twenty feet square are bad; that were this room also twenty feet high, the proportions would be worse; and were it thirty or forty feet high, they would be so bad that no art could render them agreeable. The only reason given is, that one could not, within the limits of the room, embrace the whole height of the opposite wall without throwing back his head. Are the dome of St. Peter's and the cathedral at Cologne bad architectural works because we cannot see them without crossing the channel? Besides, it is not true that we cannot see the opposite walls in a room twenty feet wide and twenty feet high at one glance without raising the head. More than this: if a central room, opening upon four adjoining rooms, needs to be carried above the roofs of these rooms for the purpose of receiving light from a clere-story, a height of thirty or forty feet would not in the least interfere with its artistic expression; and if this purpose is properly indicated in the modeling of such a room, this extraordinary height would become an element of beauty.

Also, it is not true that a room of which the ground-plan is a perfect square is for that reason inartistic. If the functions of the room are the same in every direction, either by reason of the relation of the room to adjoining rooms, or by reason of a concentrating interest toward its center, then the form of its ground-plan, to be artistic, *must* be a square, a circle, or an octagon.

But Mr. Fergusson tells us in all seriousness that to build a room twenty feet wide, its length must be thirty feet, and its height must be fifteen feet four inches, or else its form is not artistic. Can this be true in all cases, whether it be a drawing-room, sitting-room, library, or dining-room, whether its roof be flat or arched, or whether it be for the use of a private citizen or for a king?

If certain relations in the dimensions of a room favor æsthetic results, these relations must necessarily change when the nature and functions of the room are changed.

To avoid misunderstanding it should be stated here that the relation of masses to each other as dependent upon their mechanical functions, both technically and æsthetically, are truly relations of proportion and subject to methods of reasoning which are well defined, and which should be well known to the architect to enable him to compose. A moment's reflection, however, will show that the dimensions of a room or *space* of any kind can bear no other relations to each other than those determined by the use (practical as well as æsthetic) for which such a room is built.

The proportions of masses as found in monuments of architecture have, like all human works, grave faults interspersed with undoubted merits. The principles by which they are to be judged will be discussed hereafter, and it is only necessary to say at this time that there is no short cut to architectural proportions. If such rules existed, and a knowledge of them enabled men to produce great architectural monuments, architecture would become a trade, and cease to be an art.

Mr. Ruskin, who if not a profound, is certainly an

earnest and enthusiastic writer upon architecture, argues in his "Lectures" as follows:

"Now, then, I proceed to argue in this manner from what we see in the woods and fields around us, that as they are evidently meant for our delight, and as we always feel them to be beautiful, we may assume that the forms in which their leaves are cast are indeed types of beauty, not of extreme or perfect, but of average beauty.*

"And finding that they invariably terminate more or less in pointed arches, and are not square-headed, I assert † the pointed arch to be one of the forms most fitted for perpetual contemplation by the human mind, and that it is one of those which never weary however often repeated, and that, therefore, being both the strongest in structure and a beautiful form (while the square head is both weak in structure and an ugly form), we are unwise ever to build any other."

The fallacies contained in the foregoing paragraphs explain themselves as soon as stated. The fields and woods do delight us, but have evidently not been created for this sole purpose, as is clear from the fact that they also answer numberless useful purposes, not only for ourselves, but for hosts of the animal creation. We should have been delighted, in contemplating the woods and the fields, if leaves had a different shape from the one they usually have. The cactus

* The author evidently imagines that a form, wherever found or whatever the function of the object which is cast in that form, if pleasing to us, may be recognized as a form typically beautiful, to be applied with æsthetical success and propriety to any other object, no matter what its function. He is evidently oblivious that form is beautiful only in the degree in which it is expressive of functions.

† No principle of art can be established by individual assertion.

and the palm afford the delight referred to in a greater degree on account of their extraordinary tropical development, and yet they are not shaped like a Gothic arch. Leaves, we are told, are types of beauty, because we always feel them to be beautiful. True; but so is a horse, a woman, a running stream, a butterfly, a bird, a lion, a cataract, a volcano. Shall we accept the forms of all these objects of nature as the best form for an arch on that account? It is not true that a Gothic arch is especially strong, nor that a straight lintel is weak in structure, nor that it is ugly in form. Nor should we in reason apply the forms of an object to that of a space, like a window or a door.

But Mr. Ruskin, in spite of his enthusiasm, evidently feels the weakness of his own assertion, and he continues as follows:

"Here, however, I must anticipate another objection. It may be asked why we are to build only the tops of the windows pointed. Why not follow the leaves and point them at the bottom also?" A lurking suspicion that, after all, this reasoning is so illogical that it may be refuted by the simplest mind becomes apparent. The author evidently begins to doubt his theory; but rather than admit that the form of a window is not to be governed by that of a leaf, and that the reasons which may exist for the construction of the one do not apply to the other, he further involves architecture in the additional fallacy that "while in architecture you are continually called upon to do what is *unnecessary* for the sake of beauty, you are never called upon to do what is *inconvenient* for the sake of beauty; you want the level window-sill to lean upon."

An argument like the following, by the same author, needs to be cited only to show the carelessness with which important questions in architectural art are treated by earnest men:

"I cannot now enter into any statements of the possible uses of iron and glass, but will give you one reason which I think will weigh strongly with most here, why it is not likely that they will ever become important elements in architectural effect. I know that I am speaking to a company of philosophers, but you are not philosophers of the kind who suppose that the Bible is a superannuated book; neither are you of those who think the Bible is dishonored by being referred to for judgment in small matters; the very divinity of the book seems to me, on the contrary, to justify us in deferring *everything* to it, with respect to which any conclusion can be gathered from its pages. Assuming, then, that the Bible is neither superannuated now, nor ever likely to be so, it will follow that the illustrations which the Bible employs are likely to be *clear and intelligible* illustrations to the end of time. I do not mean that everything spoken of in the Bible histories must continue to endure for all time, but that the things which the Bible uses for illustration of eternal truths are likely to remain eternally intelligible illustrations."

"Now I find that iron architecture is indeed spoken of in the Bible. You know how it is said to Jeremiah, 'Behold I have made thee this day a defenced city, and an iron pillar, and brazen walls against the whole land.' But I do not find that iron building is ever alluded to as likely to become familiar to the minds of men; but, on the contrary, that an archi-

tecture of carved stone is continually employed as a source of the most important illustrations. A simple instance must occur to all of you at once. The force of the image of the corner-stone, as used throughout Scripture, would completely be lost if the Christian and civilized world were exclusively to employ any other material than earth and rock in their domestic buildings. I firmly believe that they never will."

This would sound like blasphemy or drivelling in the mouths of most persons. Mr. Ruskin's personal character and peculiar methods of thought exonerate him from such an accusation.

Sir Gilbert Scott,—a man of an entirely different type, cherishing unbounded love for Gothic architecture, to which he devoted a long and successful professional life—a man to be counted among those foremost in the profession of his country, broad, liberal, and free from prejudices, childlike and dispassionate in expressing his views and architectural faith,—in a volume called "Remarks on Secular and Domestic Architecture," says :

"Gothic architecture is in fact the most free and unfettered of all styles. It embraces every reasonable system of practical construction, though it boldly selects from among them those which are the best and most consistent, and places them in the foremost ranks as its choice and best-beloved characteristics."

"But, I hear an objector ask, what will have become of your Gothic building when robbed of its pointed arches, its mullioned windows and its high roof ? Will it not be like Hamlet with the character of the Prince of Denmark dispensed with ? Surely a building with lintelled openings or round arches, with

wide undivided windows and with low roofs, can lay little claim to the name of Gothic; and it would be better at once to be satisfied with a style in which such are the essential features than to adopt anything so effete as Gothic architecture robbed of all its leading characteristics. No such thing: even if I were advocating the omission of these characteristics, I believe a better style might be made out of what is left of Gothic architecture than the dull insipid style of the present day; it would, to say the least, have the charm of novelty, and anything would be better than the wretched routine of our vernacular architecture. Far be it from me, however, to propose anything so absurd; all I advocate is, *freedom*, *unity* of style, but liberty in the uses of it. I love the pointed arch, the mullioned window, and the high-pitched gable too well to wish to set them aside in any one instance in which they are suitable, and I hold that in nine cases out of ten they are by far the best things you can well use. All I wish to say is, that if in any one instance they are found to clash with the requirements of a building, there is a principle of common-sense inherent in Gothic architecture which will at once dispense with their use, and that nothing can be more absurd than to imagine that if circumstances forbid of one or more of these features, we must at once quit our style and adopt Italian."

And so Sir Gilbert loves architecture, not as a system arising out of a principle, but as an aggregation of forms; and of these forms he loves best the pointed arch, the mullion and the high-gabled roof. In fact he has a strong feeling that if you take these three forms away from Gothic architecture not much of value will remain;

or, as he states it further on, "enough remains, if rightly used, to give a true Gothic character to the building even in so extreme a case as this, though I should be sorry to see the experiment tried, and doubt whether its necessity is possible."

Why should Sir Gilbert be sorry to have the experiment tried, if these features of Gothic architecture must be omitted by reason of "objections to some one or more of them," as he says? If these objections are not sound objections, why take note of them at all? Architecture cannot be the football of fools who raise objections which are unsound. If, on the other hand, these objections are sound, then indeed it would not be true art to retain forms which are really objectionable, and Gothic architecture in that case would be the gainer by discarding those forms. But the author proceeds, "I have endeavored to show that the rules of the style (the Gothic) are not so rigid as to demand the use in every case of all its normal characteristics."

What is the value of rules that are not rigid? Of what use is a style that subjects itself to these rules? The truth is, no such rules exist. Sir Gilbert Scott is confounding forms which he has observed with rules or laws which he has failed to trace; his convictions on the subject of rules and laws in general are very feeble. For he tells us elsewhere (page 31), "here, as in all other cases, I would say, be master of *your* rules, but never let them be *your* masters;" he says this in relation to the mullioned window as follows: "I hold the mullioned window to be the typical window of the style, to be, in the abstract, by far the most pleasing that can be used, and I deny that in general it is open

to any objection on the ground of practical convenience. I therefore urge its use as the prevailing window in Gothic buildings."

So long as we deal with typical forms of style, which means a method of building arising out of certain conditions which once existed, and which exist no more, and urge their use on that ground alone, we are not pursuing architecture, but are creating archæological specimens worthy of a museum.

If we are convinced, with the author of "Remarks," etc., that this typical form, as he finds it, is in the abstract the most pleasing, we should at once subject ourselves to serious self-examination in order to find out wherein this pleasure consists; whether there is a good æsthetic reason for it, and whether we may adopt it and urge it upon others, or whether we must attempt other forms which are less pleasing, because they are as yet æsthetically inchoate, and need laborious working out.

If we found this effort fruitless, not through lack of ability but because a principle of art must necessarily be violated by omitting the mullion, we should continue the use of it in spite of any objection, and we should answer objectors by stating the principle involved.

Again, on the subject of roofs, we are told, "The way in which *taste* regulates the pitch of roofs, is by suiting it to the general feeling of the style. If that feeling be in favor of a horizontal tendency in the general character, the low pitch seems to suggest itself; while if the tendency be rather toward vertical lines, the high pitch takes the precedence. Thus, as the general rule, Grecian architecture delights in the

low, spreading pediment, and pointed architecture in the lofty, aspiring gable."

Supposing mediæval architects had acted upon fanciful suggestions of this kind instead of sound reasoning upon the subject of roofs, we should never have had steep roofs at all, no matter what their necessity technically or æsthetically. *Taste* and *feeling* are the will-o'-the-wisp of the modern architect. They do not lead to an elevated standpoint. Let us inquire into the condition of art to which they do lead.

CHAPTER VI.

STYLES AND FASHIONS.

The professional education of architects is detrimental to architecture; they are not taught, in the first place, that a monument, like any other work of art, is the expression of an idea in matter, and that to create a monument, the first step is to apprehend its idea; nor how human needs are to be met in their structure, nor the principles which develop forms; but they are ever referred to the history of architecture, and taught to dwell upon the forms which monuments have assumed at different periods.

These forms are all accepted as perfect in themselves, and are not critically examined in relation to their functions. The reasons why certain forms have resulted from ideas entertained at the time in which they were called into existence, the influence exercised upon architecture by climate, religion, social condition, and theoretical knowledge of construction, are not subjects especially dwelt upon in histories of architecture. It is supposed that the student has acquired this knowledge elsewhere, or that it is not essential to architecture that this knowledge should be imparted to him. Architectural history is mainly an index of styles and of the leading examples illustrating them; a precise definition of the epochs in which these styles flourished,

of the countries in which they originated, and of those in which they reached their final development.

In the polytechnic schools of continental Europe the theory of building includes the whole range of mathematics, and their application to statical mechanics, which is all that is needed in the practical construction of monuments, as far as the attainment of stability is concerned, provided the pupil pursues architectural construction in the scientific manner indicated in these branches of study, which, however, is but rarely the case. The young architect, instead, adopts the practice of the office in which he is placed, and but rarely resorts to original investigation.

The relation of mechanical science to the æsthetic development of structural forms, however, is nowhere thought of, and is not taught in any school.

The student of architecture in England and America, does not often enjoy a mathematical training of any kind; he acquires his mechanical and artistic knowledge entirely through a short apprenticeship in the office of some practicing architect, coupled with a desultory reading of art history.

The prevalent practice of professional men also is not conducive to original thought in construction, for the reason that their work is pursued in certain grooves, and pertains usually to structures of one and the same class, the detail of the construction of which, good or bad, is accepted as established. Hence it is that the pupil never learns to know the need of personal investigation in mechanics, and hence mathematical knowledge is thought to be of no special use in architecture.

If he ever had a mathematical training, there is now no necessity for it; he permits himself to become

rusty, and is finally incapable of reverting to what he once knew.

This state of things in England is more especially aggravated by the employment of so-called architectural surveyors, whose business it is to make out bills of quantities, and to survey completed work; and also of special assistants, who devote themselves to the matter of construction alone. Thus the work of the architect becomes entirely decorative, and in the pursuit of this decorative work he is wholly guided by the so-called rules which govern style.

The current admonition addressed to the student is to observe and study the forms of each separate style, and to use these forms, and no others, when he works in this special style. He may omit some of them, but must not add to any style new forms which do not clearly belong to it, nor mix the forms of different types. That certain forms belong to a style is established upon historical and archæological grounds, and must be illustrated by undoubted authority of past practice, to be recognized as sound architecture.

The result of this system of education is, that the student acquires no knowledge of architecture as a creative art, but as an art already determined for him. Of this art he knows results in the shape of forms attained, but not the causes of these forms nor the methods of reasoning and the motives which actuated their authors. As history relates to a long series of architectural efforts, based upon a variety of ideas expressed with progressive ability and cumulative knowledge, the final results of each salient period are not only different in character but antagonistic in expression. It is true that all this is the result of the

unvarying principle of art creation, based upon unerring laws of nature perfectly consistent with progressive changes; but as these laws are not considered by the architect, he soon finds himself a blind partisan of some special style or type of architecture, and practically an opponent of all others. To this must be added the fact that the student of architecture, who enters upon his studies with youthful ardor, is apt to regard the forms and styles first presented to him in history with exclusive affection, and by the time he has mastered these forms he has become a faithful believer in their efficacy, and rejects subsequent styles and methods as useless, not pleasing, and unworthy of attention. Hence it is that the majority of architectural students who begin to study history never go beyond the first few chapters, wherein they learn that at some remote period of time men lived in caves, and then in tents, and finally in wooden houses, and that, having thus supplied their wants while living, they built pyramids and tombs to supply their wants when dead; and, finally, that they erected temples to the gods—Egyptian temples, Greek temples, and Roman temples. By this time the young student is in possession of quite an architectural vocabulary, and of forms enough to set up a respectable antique business, and to talk volubly of intercolumniations, architraves, proportions, flutings, orders of architecture, the acanthus leaf, and the great art period of antiquity.

It is felt to be desirable, of course, to know something of mediæval architecture, which is accepted to be barbarous, being an art product of the Dark Ages, and also of the revival of antique art, which brings us down to the present day. The revival is not difficult to mas-

ter; its elements are contained in Greek and Roman work; the mediæval work need not be mastered if one will only join the great chorus of Renaissance architects who are doing the business of the world. Hence, many join the chorus, but a few proceed further; they enter the intricacies of the Romanesque and Gothic, examine the Moorish, and are not indifferent to the productions of the rest of the world.

However, the great majority of students of architecture come to the conclusion that architecture as an art is now dead, that it has existed heretofore in various forms called styles, that these styles were in themselves each a perfect system of architecture, that all we need to do now is either to devote ourselves to one of these styles or to another, or perhaps to two for special uses in different kinds of structures, and to build in those styles. Each style has its forms, its mouldings, its decoration. Do not let us mix them, but use them discreetly, as we take them from the pigeon-holes of time and place them upon the exterior or interior of our buildings of to-day. Now and then we are startled by a refractory railroad station, which evidently resists being cramped into the style jacket; or a warehouse, or a factory, or a modern church, or a parliament house: what we do in cases of this kind, is to clothe some of these structures in the mediæval armor or the *robe de chambre* of the Renaissance, and to pronounce others incapable of architectural treatment. These latter buildings, thus liberated from the thraldom of modern architectural art, fall into the hands of the engineer, who constructs in a rational manner without attempting art, and the result is a very healthy sort of art production, of low degree to be sure, but

of decided merit. See Paxton's exhibition building and some modern railroad structures.

This state of things has no existence outside the so-called European civilization which pervades Europe and its colonies, and had no existence in Europe prior to the Renaissance period. Nor does it exist anywhere in any other art or in science. All these are progressive everywhere, with varying results during special periods of time, but progressive upon the whole. Dress, European dress, may be cited as the only parallel case, with the exception that European dress never resorts to antique or mediæval forms, excepting so far as to adopt isolated features of these forms in a modified way, but revolves erratically among the styles of the last three centuries, and frequently changes directly to periods far apart in time, and often antagonistic in system and expression.

A striking difference between the dress system and architecture is this: that the authors of the architectural art at all times hold that the forms used by them are intrinsically beautiful. The tyrants of fashion do not claim the element of beauty to be a necessity; on the contrary, they admit that none of their forms are, in the abstract, beautiful, but attempt to please by sudden and frequent changes from form to form, with such rapidity that the majority of mankind, who are kept in a state of constant excitement by novelty, overwhelm the few thinking minds who revolt against fashion as it is, and thus prevent a change in the right direction.

The architect often meets with problems wherein the ideas tend to the development of forms which do not correspond with the forms of his favorite style,

or perhaps with the forms of any style. In this case, the architect adheres to the forms, and condemns the ideas. The artist in dress is bolder and more consistent—he remodels the human form to suit the fashion. In one respect they both proceed upon the same principle. They change their style to please the public—with this difference, that the architect changes when he finds the public indifferent to his work, or when he himself begins to doubt its efficacy, while the artist in fashions changes his forms periodically, and thus assumes the lead of public opinion. They agree in this, however, that they are the judges of the forms to be selected, that these forms are to be judged as a whole, and are not to be analyzed in detail; that the detail is of no especial import, and that the whole needs to have no relation to the purpose it is to serve; and also that the public is to be pleased with the work, and that this is the sole test of art success.

If a pointed boot is to be the fashion, men's feet must be compressed into it and become beautiful thereby; if the Tudor style prevails, then churches and school-houses must have battlements in spite of their peaceful import. The woman of fashion wears buttons, where a button is of no earthly use, and hence has no meaning. The modern chapel has buttresses where there is no lateral pressure. Modern pantaloons convert the human leg into a candle-mould. Bold gabled fronts hide flat roofs which do not shed the water; and gargoyles are placed where no water runs.

The modern architect is not trained to examine the value of architecture in the abstract—what it is, what

it means, or what we should endeavor to make it; he tries to find out what it was, not in principle, but in form, and is content if the form please him. He judges of the forms as they please him more or less; he says St. Peter's is grand, Cologne is better; or, perhaps, Cologne is feeble, and St. Paul's is perfect, because he feels it to be so. The reasons why a person feels one work of art to be better than another are of the most heterogeneous character; generally he has been told to feel so when young. The students of the Ecole des Beaux Arts felt that Renaissance architecture was true art, and they mobbed Viollet le Duc because he doubted it.

More often one feels that to be the best which he can understand best,—he prefers the "Rake's Progress" to "Raphael's Transfiguration," or he dislikes what expresses ideas which have not his sympathy, as Ruskin hates the Renaissance. Plato despises all art, because to his mind it is useless; the modern architect has a contempt for construction, although it is indispensable to building, while art to his mind only represents that which is unnecessary.

All agree that the greatest crime in architecture is to mix features belonging to different styles. All art, to be sure, depends upon unity of treatment; but the architect ignores unity excepting as the work of a special period of the past. If works of the past contain heterogeneous forms, unmeaning forms, or even forms belonging to periods far apart in point of time, it is perfectly legitimate to reproduce these mixtures whether they are harmonious in themselves or not, but what we do to-day must be sanctioned by time. If it be, right or wrong, we may do it again.

The argument of the Renaissance will illustrate the fallacy of this proceeding. Mediæval architecture expressed a peculiar form of Christianity and social organization, which placed a large majority of the people at the mercy of a rude and greedy clergy and aristocracy. The material condition of the people was brought to the lowest ebb; and the rulers, not to be overwhelmed by the nobles and the clergy, sided with the people against them. During this triangular fight the revival of classic literature displayed pictures of Greek liberty, virtue and heroism, which on the then prevailing background of rude force, oppression and personal greed, stood out in bold relief and disgusted thinking minds with the prevailing political, religious and social conditions and their art forms.

This disgust finally terminated in the upheaval of the Reformation. But long before its outbreak as a spiritual controversy, the art forms of the period had fallen into disrepute with poetical and thinking minds. "These cathedrals and castles," they said, "represent a state of things so repugnant to our feelings that we will have none of them. We must return to Greek and Roman forms." An æsthetic examination of the subject would have revealed the fact that an architecture capable of expressing any idea with force sufficient to make us hate it because we hate the idea, must contain elements efficient to express other ideas equally well. But no one examined philosophically: to Greek and Roman forms they returned, to find before long that further development was needed to adapt these to the complicated ideas which had been created by Christianity and an advanced state of social and political

civilization. The intention no doubt existed to proceed with this development, and it still exists, but it has never been realized, for the simple reason that every change which suggested itself led to forms similar to those existing in mediæval art, which forms, it was held, must be avoided in order to be consistent.

The cause of this failure is to be found in the fact that the architecture of the time was not in the hands of architects, but in those of gentlemen of liberal literary and artistic education indeed, who, however, knew nothing of the relations of architecture to construction, and but little of construction itself, either as a science (for in that form it did not then fairly exist) or as a trade, because their apprenticeship was served with sculptors, painters or goldsmiths. Previous to the Renaissance, during the Middle Ages, architects were the stone-cutters of the times, a guild who, under the name of freemasons, built the cathedrals of Europe. Endowed by the Pope with a special charter, which granted to them certain privileges in all continental states, and governed by their masters and grand-masters, under the guidance of the clergy, this organization extended over a great part of Europe, and accumulated an amount of practical experience, alike in the mechanics and in the æsthetics involved in their work, which at this day commands the admiration of both the architect and the engineer.

Under a discipline designed for an association of laymen, attached to this special service of the church, living in encampments near their work, subject to the orders of their masters and grand-masters, who directed the whole economy of their work and living, this devoted band of men—without the positive knowledge of

mechanics which exists to-day, and without great personal refinement or art education, but with a devotion to the work in hand, each trying to do his part well, for the glory of the church; guided by men equally devoted, who understood the value of the art work and art expression at the disposal of the church—built monuments of architecture, which up to this time must be admitted to be the most godlike creations of man.

They learned mechanics from their own failures, and architectural composition by continued attempts, corrected by themselves and their superiors; but every point gained was held fast, noted and embodied in their rules, and faithfully maintained until changed by a further advance. Thus art and construction went hand in hand, until in the thirteenth century was attained that perfection which to-day we are proud to comprehend, if not able to imitate or to apply to our present requirements. The wars of the Reformation and the revival of antique art in Italy reduced the freemasons' organization to a series of disjointed chapters, which continued to exist as local guilds until the beginning of the present century, and traces of which may be found in parts of Scotland and Germany to this day.

We have since had a revival of Gothic architecture, which, like that of the Renaissance and of the antique, deals in the adaptation of special art forms to present uses. Its success is for that reason also without art results.

It is true that mediæval architecture contains at least all known methods of construction required in modern building, and an artistic treatment which may be accepted as a desirable starting-point for further

progress. This fact is recognized by many thinking minds among architects of the day, but why this progress has not yet been essayed upon must be reserved for a future chapter.

The division of the schools, however, has confirmed their respective adherents in the practice of styles, or rather in dealing with the forms of styles. This method of building in forms, without regard to the principles which generate forms, has, in turn, stimulated a periodical change of style, and thus architecture has ceased to be an art and has become a fashion.

The popular love of change is the intuitive desire for improvement in all art productions. Man expects progress in the usefulness of objects of mechanic art, and progress in the expression of ideas in objects of fine art. This progress is a healthy change which should be fostered. The vacillation of fashion and the constant change in architecture from style to style is change without progress, and hence only a counterfeit of an advance in art. The popular architect has descended to the place of a broker in architecture. Construction, decoration and sculpture are removed outside of his professional sphere, and he only retains an advisory power in the appointment of others to do this work for him, while he himself wields the baton by which he gives the sign from time to time for a change of style, or the advent of a new fashion.

This state of architecture has led to peculiar relations between the architect and his clients, which deserve a passing notice to illustrate popular views of the art.

CHAPTER VII.

ARCHITECTURE AND ITS PATRONS.

We pursue art, Ruskin says, with the curtain up and an audience before it, while the great work of the Middle Ages was done for the love of God. It is subversive of true art, this attempt of pleasing an indiscriminate audience. Art can be successful only when pursued for its own sake. Much poor and indifferent art has been fostered in this way in popular paintings and trashy literature.

All art finally seeks appreciation and a market with an audience; but it is successful as art only in the ratio inversely proportional to its dependence upon *immediate* popular approval. Architectural art is especially unfortunate in this respect; it submits to popular interference while in the process of creation.

Wagner says music is capable of, and must be wrought up to, greater flexibility and a nearer accord with the thoughts it is intended to express. The compositions of the past assume too much the form of geometrical crystallization to express human passions and emotions. I can create a new music, and I will do so; but where, it is asked, will you find an audience to listen to such music? Your music will remain forever a manuscript unknown. Be it so, says Wagner, I must write what I know, and in the man-

ner in which I know it, whether I have an audience or not.

Offenbach thoroughly knew the depraved tendencies of the multitude, and was willing to set them to music. When his score was complete he raised the curtain and electrified his audience. Will this sort of art secure him a place in the Walhalla? No! nor in the hearts of the very men who applaud him; but he knew this well enough, and was content to tickle the public fancy for the moment and die forever.

The modern architect goes further than this; he puts his thoughts upon paper, and before he executes them he submits them to laymen for approval.

There is no art or trade—there never was one in this world outside of modern architecture—which is found to be willing to court popular criticism and to abide by its decision before its works are executed.

The architect submits to laymen a design of what he intends to do, and thereby admits, what is utterly false, that laymen are competent to compare a series of such designs, and select the best, or that they can form a correct judgment of any one of them.

To understand the enormity of this error, it must be remembered that the critical intelligence required to judge an architectural design involves far greater erudition and a more comprehensive knowledge of the subject in general and in its detail than to prepare such a design.

There are many architects, who, having earnestly thought upon the subject, can compose a measurably successful design, just as a person of sensibility for music may invent a ditty sufficiently spirited and sound in its combination to serve as the motive for a

musical composition in the hands of a master. It is not unjust to assert, on the other hand, that but few architects are capable of analyzing an architectural design, and those who are will need a larger allowance of time than is generally consumed by an average committee of laymen who imagine that they do this work.

An architectural design is a conventional geometrical representation of an imagined object, the merits of which laymen attempt to determine by looking at this conventional drawing. It is true the architect is supposed to assist the process by furnishing a perspective view; but here the layman is more at sea than ever. He is pleased with the technical skill and the artistic feeling which are displayed in the production of this picture. He admires the picture, and imagines the architecture it represents to be good; or he is displeased or left indifferent by the picture, and condemns the architecture.

The great injury done to architectural art, however, by this system of submitting architectural designs to the judgment of laymen is far greater than would at first appear.

To correct an error one must have either the authority to do so, or the skill to prove it to be an error.

The latter process demands a certain intellectual preparation on the part of the erring party, and the ability to argue the case on the part of the party administering the correction. Had the architect the authority to correct his client in the same sense in which it is conceded to the lawyer, the doctor, the shipwright, or even the tailor or shoemaker, he would be employed by reason of the merit of his finished

works, and would not be asked to submit a design for approval.

It is true he is granted a polite hearing on all questions relating to his work, but is time accorded to him to educate his client to the degree necessary to comprehend his arguments? Is he himself master of the theory of his art, and trained to debate these questions? Can he, if personally able to do so, impart to a client in a reasonable series of conversations what can be acquired only by a long professional education and practice?

There is nothing left for him but to raise the curtain before the scene is set and the footlights lighted; he begins to recite and to yield immediately to half a dozen suggestions, not from competent stage manager or the author, but from an audience which should not have been admitted until everything was ready to entertain it.

As long as this system is pursued, architecture must range with the fashions and not with the arts, and so it does in fact.

CHAPTER VIII.

MATERIALISM IN THE CHURCH.

It is not intended in this place to speak of materialism as the promise and potency of the ultimate atom, but as that human vulgarity and greed which places the gratification of self, of personal needs and comforts, above all other considerations. This materialism is the offspring of the wide-spread "little learning" of the present age, of a general education which, because it is so shallow, fosters conceit, prejudice and obstinacy, but not wisdom. This modern intelligence is skin deep, and is no respecter of better-informed persons. It has a profound contempt for the past, its experience and its poetry. It boasts of being eminently practical, and is bent upon saving space and money whenever opportunity offers.

A dining-room, to the modern practical man, is a place to feed in, not a place to enjoy intelligent social intercourse during dinner. The question is, how many square feet does a man require to sit at the table, and how much space for the servant behind his chair? These statistical items (and the modern practical man is great on statistics) determine the size of his dining-room and also its form. A drawing-room is a storehouse for the standard set of parlor furniture, with just room enough for its probable occupants to brush by each other.

Any room is a well-fitting box to hold certain persons and objects, and no more. The practical man has no need of dignified repose in the arrangement of a group of persons assembled for any special purpose, not even for the worship of God. Every inch of available flooring space in a church must be covered with pews, and no room wasted, as he says, for other purposes. If, by any contrivance of modern engineering, a roof can span a large space and be built cheaply of thin material, he glories in such a scientific triumph over space and matter, and insists upon introducing it in a monument erected to the glory of God.

It is hard to make such a being understand that a difference exists between the mushroom and the oak, between the beanstalk and the palm, and that no art work is possible unless we show our appreciation of its dignity to this extent, at least, that we are not willing to trifle with it in any sense, and that we feel impelled, not merely to construct a huge umbrella for the protection of a fashionable congregation, but to build a monument for all time illustrating the greatness of God, in which a human congregation is an incident, in which our presence is a privilege and not a right, in which we are humble guests and not owners, in which, for a time, at least, we realize a power beyond and above us, and an utter dependence upon that power. No amount of decoration will be a sufficient apology for the broad falsehood proclaimed by such an act of selfishness and conceit, and such a denial of our dependence upon God and Nature. If this is the house of God, and we are only guests and petitioners therein, we cannot arrogate to our use the whole space contained in it. The remainder, not devoted to any purpose,

will at least indicate the fact that it is reserved *from* ourselves, and that is in itself expressive of an idea. All religious systems which have existed heretofore have surrounded worship with impressive ceremonies, which convey to man's mind religious ideas as developed in human emotions and human acts. These acts may be simple and insignificant in themselves, akin to humble acts of every-day life, but distinguished from them by reason of their import, in the manner in which they are performed. "Do this in remembrance of Me," Christ said; and the breaking of bread and the drinking of wine have become the principal and leading religious ceremony of the church. As a naked fact, we simply eat and drink. By what process is this humble, human act converted into a religious function, conveying an exalted idea in its performance? What is there in this act that produces emotions not known to be connected with the mere process of eating and drinking elsewhere or otherwise? It is the grouping of the communicants in relation to the priest, the congregation and the church; their posture, and the acts and postures of those surrounding them. All these express an act of devotion. The grouping is a picture conveying an idea. The idea conveyed by this picture produces the emotions. Modern Protestantism, in its extreme form, administers the communion by passing the elements round to the communicants seated in their pews. The infelicity of this arrangement must be apparent to every well-balanced mind. The performance of the act should always—but it does not in this case—correspond with the idea to be conveyed. To partake of the communion is a privilege which is sought for, and not one that is brought to us while we are

leisurely awaiting it. Ultra-Protestantism is content with rejecting in this and other similar instances every picturesque form representing an idea, while the idea itself is tenaciously retained; no effort being made to substitute other forms equally expressive or any forms whatever that express it. This is done under the impression that all forms, all ceremonies, in fact, all art expressions of religious ideas are unnecessary in the process of making man religious. Whether this is true or not, need not be discussed here; but it must be understood that the moment a picturesque expression of religious ideas is abandoned, we also abandon the structure which contains and accommodates these picturesque groups. We abandon the church as a place of worship, and sink down to the lecture-room or the theatre, where a literary performance is most conveniently accommodated, and nothing else is expected. We substitute a shop for a library, a barrack for a dwelling, a bar-room for a dining-room, a stable-yard for a garden.

Is it the intention of intelligent churchmen that this should be so? No; certainly not. None of them are willing to give up entirely the idea that the church is a house of worship, a house of God, and that a certain degree of orderly arrangement and devout grouping in churches is necessary. Why is it, then, that this materialism has crept into the church and has now possession of it? The examination of this question may lead to sound results, and is reserved for its proper place hereafter.

The human body, physically considered, is a most marvellous mechanical apparatus, capable of performing mechanical work. The distinguishing characteris-

tic of man, considered from the stand-point of art, is the expression or index of his mind. Mental vigor and mental qualities, moral strength and weakness, mental peculiarities, virtues and vices, are the subjects to be expressed by art. To make a sectional drawing of a human figure, representing all the working apparatus—the skeleton, muscles, veins, nerves, skin, etc.—is not a work of fine art. Fine art involves the expression of an emotion. A structure, whether its purpose be avowedly ideal, like that of a house of worship, a place for the administration of justice (a court), or a parliament house (where human laws are enacted), or whether it serves for mere personal use, like the dwelling of an humble citizen, cannot be considered simply as so much shelter from the inclemency of the weather; but it must be considered also as an abode of human beings, with souls capable of moral reflection, minds stored with memories of family and social life, hearts capable of impressions, sentiments, affections, duties and feelings, comprising more or less the large range of poetry pertaining to human life. The humble dwelling, therefore, like the church, the court, the parliament house, or the palace, while it performs physical functions, also represents a certain amount of thought, sentiment and ideas, which must be expressed in its form that it may become a work of art. In other words: every structure, like the human body, that assumes to be a work of art, must also be possessed of a soul. The relation between that body and its soul is intimate. What the nature of that relation is, will be treated of hereafter.

This practical age believes in food, clothing and shelter; and in money to buy more food, clothing and shel-

ter; but not in thought, not in ideas, not in emotions, nor in their artistic representations, nor in their results: in truth, it knows them not. Men have heard somewhere, and they are not prepared to deny, that a vast amount of human thought is accumulating through the course of time. It is popularly believed to be stowed away in books only, and in the minds of those who read books. But men know not that thought lives in every created thing, and more especially in the work of human hands known as art work—the greatest of all work, inasmuch as it recreates ideals that are good, true and wise, besides exposing what is false, foolish, vicious and ridiculous; inasmuch as it teaches men whether they desire to learn or not, teaching the most ignorant as well as the wise; appealing to the emotions which are capable of comprehending, in a manner confused, to be sure, but with certainty, while the mind is often unprepared to comprehend at all. It would be a blessing, perhaps, to take all this away from them for a time, and see what will be their condition at the end of that time in a material direction; how their stock of food, clothing and shelter, and the worshipped money would compare with that which they are now permitted to possess.

The modern practical man thinks himself wonderfully wise: he believes in the potency of money, and has faith in nothing else; yet he does not act quite up to his profession: he needs a house, and with all his boasted contempt for birth, position, learning, and knowledge of art, he is not content with a mere shelter, even a good, well-built shelter, which would make him a respectable abode, as far as a fitting dwelling-place can do that: he would like a castle; but knowing that

a castle would make him ridiculous, he compromises on a villa and sends for his architect. "I want a villa," he says, "a nice modern villa, with all the conveniences and appurtenances of modern villas. I do not want to spend a mint of money like Mr. ——, or Mr. ——, or Lord ——. I do not want a library as large as a meeting-house, nor a dining-hall or drawing-room bigger than I need; nor do I approve of so much cut-stone; it is so very gloomy, reminding me of the keeps and dungeons of the Dark Ages. Above all things, protect me from stained glass, steep roofs, or any other Gothic abomination. Let the building be light and airy, and trim and pretty to look at. I fancy that an Italian villa would be the thing, and as I have seen them in Italy, where the villa is a native production, it is a structure that may be plastered inside and out, and painted in imitation of stone. I hate the look of chimneys, and what I especially desire is to have the roof concealed by a parapet or balustrade. Remember, above all things, that it is cheaper to insure a building than to build it fireproof, and that no one can see the difference when the building is completed." Thus speaks the proprietor of the future villa, with the conviction that his instructions are to the point, and conclusive; but the architect, who may have a conscience, though materially dulled by the building of many villas of this description, ventures upon the modest remark that no æsthetic advantage is to be gained by the use of inferior materials, nor by the substitution of one material for another; but, being brought up with a sharp turn by his patron, who condemns all such theories as sentimental and unworthy of a practical

age, and who says that these things are frequently done by eminent architects whom he might name, the architect winds up his argument in a conciliatory strain somewhat as follows: "I am very much of your opinion, for forms beautiful in themselves cannot be condemned on account of the material they are wrought in, nor the use they are put to. St. Peter's at Rome would continue just as beautiful if it were converted into a riding-school, and a fac-simile of Westminster Abbey in cast iron must, by a parity of reasoning, make an equally good cathedral. There is much specious talk of expression and character in a structure; but Mr. Fergusson says distinctly that a building tells no story, nor is it directly the cause of an emotion." So the architect takes leave of his client with a submissive smile, and proceeds to design his villa, and he builds it. When it is done, one cannot help but think that neither the owner nor his architect understood the nature of a house occupied by a gentleman, but that it is impossible for man to do anything in the direction of art without giving some sort of expression to it, whether he intends to do so or not; and that this villa somehow declares, in the strongest terms, as if written upon it in large letters, "This is the house a snob built."

PART II.

NATURE AND FUNCTION OF ART.

CHAPTER IX.

IS ART NECESSARY?

Before engaging in a discussion on the nature of art, on beauty and the emotions, it is desirable to consider whether or not art performs a function which affects the well-being of man. A majority of writers on æsthetics affirm that in every work of art it is a condition precedent that it shall not be necessary. This involves another question. What is and what is not necessary to man? And furthermore, admitting the beautiful to relate to ideas, to emanations of the mind, are these essential or not? Some have questioned, with a certain degree of plausibility, the absolute necessity of raiment and shelter. There is no doubt that, in some climates, men live on a moderate supply of food and atmospheric air alone. A limited number of human beings do so in a few favored spots of the earth without work, without thought, without reflection, without instruction. Prompted by hunger, they arise to eat and lie down again, or wander about, as seems to them most desirable. The moment, however, that this limited number of human beings increases, and can be no longer supplied by the spontaneous growths of nature, they must resort to agriculture, and also to emigration to countries where the climate is more rigorous. Shelter and clothing become equal necessities with food; and

manufactures of agricultural implements, the erection of granaries, trade and its attendant appliances, create *property*. Hence, various methods of protecting that property—social interests arise, and combinations for the protection of these interests, by means of laws growing out of thought and moral reflection. Laws have to be maintained by physical force; hence, individual devotion to the public good, amounting to heroism, a disregard of *life*, or the voluntary sacrifice of it, for the maintenance of moral truths. The human frame is subject to injury from excesses in the gratification of the appetites as well as from over-exertion and exposure. Nature suggests remedies to alleviate or remove suffering arising from these sources; hence, to sustain life man inquires into the laws of Nature and her productions. A moderate amount of reflection on the problem of our being, shows us our utter dependence on each other, and especially on the sustaining powers of nature; hence, everything connected with her laws and productions becomes matter of profound study.

Individual thought and inquiry into nature, which includes man himself, has so accumulated through historic times as to form a cosmic intelligence, the most valuable of human acquisitions. So intimately is this asssociated with man's individual existence, and also with his moral, political, social and religious relationships, that it is impossible to estimate the deprivation to humanity, should any portion of this cosmic thought be lost to us. But few of us are able to add materially to this stock of cosmic thought: the multitude can know but little of it; many however are capable of being instructed by it; and it is nec-

essary for the maintenance of society that the number of these should be, at all times, as large as possible. All men know the necessity of supplying physical wants. They know that they must eat, be clothed, and sheltered from the weather. They also understand that in order to procure these necessities it is imperative that they should render some service to society—that they must labor. Hunger, exposure, and other physical suffering, which are immediate results of a lack of these supplies, promptly remind them of this condition of things. But effect and cause do not follow each other in all relations of social life as promptly as hunger does the want of food. Systems of government and of law, of morality, of religion and social relations are the foundations upon which rests our social fabric; and upon these systems depends individual prosperity and happiness.

These systems, however, are the outcome of the intelligence of the communities in which they originate, and mainly the result of the teachings of individuals. There are men who love and pursue knowledge for its own sake, who inquire into the phenomena of nature for the truths they reveal; others who study nature's laws for the benefit to be derived from this knowledge by their fellow men, and others again who study these laws in order to find fitting answers to the questions man puts to nature relating to the source of his being—the conditions which govern human life here and hereafter. The methods pursued in communicating knowledge, again, differ with the nature of the men who teach, and the intellectual development of the persons who are taught. Great and fervent natures—overwhelmed with the magnitude of

their conceptions, realizing in them the laws of the divine mind, and aware of their potent influence on the fate of man—experience an irrepressible desire to communicate their mental treasures to the world, and have promulgated these laws as the direct revelations of the Deity, which in a certain sense they knew them to be. Overwhelming emotions seem to them an inspiration, and it is not surprising that they believe them to be so. This method of instructing mankind, and directing it in the path of virtue, akin to the transcendent splendor and rapidity of the meteor, is, like the meteor, a rare occurrence on the intellectual horizon, and is called forth and made resplendent by a previous mental and moral darkness, which periodically occurs in the history of the world.

Many profound thinkers earnestly in search of truth, less bent on making discoveries than upon removing doubt by demonstration, content themselves with stating results in unimpassioned language. Their audience is small, but well prepared to receive, to hold and to use what is communicated to it. Others again, more enthusiastic and perhaps less profound, distinguish themselves through devotion to some special idea. For their convictions they lay down their lives. These are the heroes and martyrs of the world.

Next we come to those, who, impressed with the merit of ideas advanced by themselves or other persons, found in history, legends, or poetry, ideas of a moral nature, of human relations, of love and hatred, of wisdom and folly, of national, social, and religious import —the trials and triumphs of virtue, the errors and punishments of vice, the devotion and heroism of king, citizen or slave, the adventures of the traveler, the

functions and power of the law, the lights and shades of humble life, and the splendors of courts—present these ideas in the most expressive forms, rendering them through words, through paintings, through sculpture, and through architecture. Ideas thus presented are sown, like seeds, in the human heart, taking root there, stimulating the brain and arousing reflection, withholding man from evil and idle pursuits, and bringing him back to nature and her beneficent influences, kindling a spark of the divine tendencies, which may not be reached by the force of the law, nor by the promises and threats of religion, nor by the subtle arguments of philosophy. The men who do this are the artists of the world.

The economy of human labor and of human association is guided by human thought, as truly as muscular effort is guided by the action of the nervous system. Suspend mental influence, and muscular action becomes inert, or exhausts itself in useless effort. The human body needs the guiding care of a healthy brain, the body politic the teachings of human thought. Abstract thought, conveyed in the language of philosophy, is understood by those only who are prepared for it by a special training. But nature and art bring before us pictures of life, imitations in painting and sculpture, in the word-paintings of the poet, in music, which speak of the emotions, and in architecture, which embodies them in stone. Through these we receive sensuous impressions of thought realized in action and emotions. We can all see and hear, and learn from these,—only as much, indeed, as we are prepared to receive, as we can understand at the time; but we learn always. Human art, through language and the instru-

mentalities of form and order, is the exponent of the mystery and beauty of human life. An idea associated with a material object remains more firmly fixed in the mind than an idea presented to us in its abstract form. Garrick is reported to have said that the superiority of the impressions produced by the stage over those produced by the pulpit is owing to the fact that the actor recites falsehood as though it were truth, while the preacher utters truth as though it were falsehood. This is not stating the whole case. The actor acts an ideal scene with the truthful accuracy of nature, and hence the force of the impression he produces; while the preacher exhorts in the form of abstract thought, and hence our indifference.

The salient points of a good play are remembered for life, and the melodies of an opera haunt us for days after hearing them; a sermon is often forgotten before we leave the church; and yet enthusiastic religious speakers have drawn pictures of heaven and hell in words which have driven their hearers into lunacy.

What has been said here with regard to the expression of ideas in art, and its necessity to man, is most beautifully and forcibly illustrated in Lamartine's sketch of the life of Homer. He speaks first of the faculty of man of reproducing nature in art work as follows:

"One of the most natural and universal faculties of man is that of reproducing internally, by imagination and thought, and externally, by art and speech, the material and moral universe in the midst of which he has been placed by providence. Man is the reflecting mirror of nature: everything is recreated by him; and

thought, poetry, everything is reanimated and receives new life. It is another state of existence, which God has permitted man to make, by multiplying external being in his thoughts and in his words—an inferior form, but not less real, which truly creates, although it only does so from the elements, the images, and recollections of what nature has embodied before him. An imitation like the sport of a child, yet still the play of the mind upon the impressions which it receives from nature,—a play in which we continually reiterate the fleeting image of the external and internal worlds, which expands, passes away and renews itself unceasingly before us. Therefore does poetry mean creation."

And then of the benefits of art productions to mankind. "And now is poetry worth this sacrifice? What influence had Homer upon civilization, and how did he contribute to its extension? To answer this inquiry it is sufficient to read. Suppose in the infancy or youth of the world, that a half-savage man, endowed only with the elementary, gross, and ferocious instincts which are the foundation of our animal nature, before society, religion and art have moulded, softened, spiritualized, and sanctified the human heart: suppose that to such a man, alone in the depths of the forests, and engrossed by sensual appetites, a heavenly spirit were to teach the art of reading characters traced upon papyrus, and then to disappear, leaving with him only the works of Homer. The savage reads, and as he turns page after page, a new world opens before his eyes; he feels expand within him thousands of thoughts, ideas, and feelings unknown before. A mere sensual being when he began to read, he has become an intel-

lectual, and will soon be a moral creature. Homer reveals to him, in the first place, the superior world; the immortality of the soul, the judgment after death; sovereign justice; the expiation; rewards according to our virtues or our crimes; heaven and hell, disguised no doubt by fables and allegories, but still visible and apparent though these symbols, as the figure beneath the drapery, which covers while it shows it. He next tells him of glory, that passion for mutual esteem and eternal honor, which has been given to men as the instinct most nearly allied to virtue. He teaches him patriotism in the exploits of the heroes who leave their ancestral realms, tearing themselves from their wives and mothers, to shed their blood in national expeditions, like the Trojan war, to give honor to their native land. He tells them of the calamities of war, by describing the burning of Troy and the combats beneath the walls. He teaches friendship by the example of Achilles and Patroclus; wisdom by that of Mentor; conjugal fidelity by Andromache; consideration for age by the old king Priamus, to whom Achilles gives up with tears the corpse of his son; disgust for outrage to the dead by the body of Hector dragged seven times around the walls of his own capital; compassion for Astyanax led into slavery by the Greeks while still a child in his mother's arms; the vengeance of the gods, in the early death of Achilles; the consequences of infidelity in Helen; scorn for the breach of domestic ties in Menelaus; the sacredness of laws, the utility of trades, the invention and the beauty of the arts everywhere: in short, the interpretation of the language of nature, always pervaded by a moral significance, revealed in each of its phenomena in earth,

sea, and sky; as it were a cipher of correspondence between God and man, given so completely and so exactly in the verses of Homer, that the unseen and the natural world, reflected each in the other like stars in a lake, seem to be but a single thought, and to speak with but one harmonious tongue to the gifted intelligence of the sightless poet. And yet this language is marked by such a melodious rhythm in its measure, and is full of such music in its expression, that each thought seems to enter the mind through the ears, not only as an intelligent idea, but also as a sensuous delight. Is it not clear that, after a long and familiar intercourse with this volume, the brutal and ferocious instincts would disappear, and a moral and an intellectual nature expand in the savage to whom Homer would have been thus taught by heaven? What such a progress would have done for a single man, Homer effected for an entire nation. Scarcely had death interrupted his heavenly song, before the rhapsodists, or Homeric bards, wandering minstrels—their ears and memories still ringing with his verses—passed from isle to isle and through all the towns of Greece, each boasting the exclusive knowledge of some mutilated fragment of his poems, and reciting it year after year, through one generation after another, at public festivals and religious solemnities, in the halls of the palaces and by the cottage hearths, as well as in the school full of children; so that an entire nation became a living and imperishable repository of this universal volume of classical antiquity."

"In the time of Ptolemy Philopater, the Smyrneans built him temples. The Argives also paid him divine honors. For two thousand years one soul breathed its

spirit over this portion of the world. In the year 884 B. C. Lycurgus brought Homer's verses to Sparta, to train the minds of its citizens. Then came Sŏlon, the founder of the democracy of Athens, and who, a greater statesman than Plato, understood the influence of genius on civilization, and had these scattered fragments collected into one book, as in later days the Romans collected the sacred pages of the Sibyl. Then came Alexander the Great, anxious above all things for immortal renown, and well knowing that the key of the future is in the hands of the poets; he had a casket of marvelous richness made to contain the songs of Homer, and always put them under his pillow that he might enjoy heavenly dreams. Then came the Romans, who esteemed none of their conquests in Greece equal to the possession of these poems; and all the poetry of their nation was but the lengthened echo of this voice from the rocks of Chios. Then followed the darkness of the Middle Ages, of barbaric invasion, which, for nearly a thousand years, sank the West in ignorance, and which was scarcely beginning to break before the manuscripts of Homer, undiscovered among the ruins of Paganism, again became the study and the source of inspiration and enthusiasm to the minds of men. Thus the ancient world, with its history and poetry, its arts and trades, its civilization, manners and religion, is all contained in Homer; and even the literature of the modern world owes its existence in so great a measure to him, that before this noblest of inspired writers, no man, be he who he may, could without blushing take the title of poet. To ask whether such a man may be ranked among the benefactors of the human race is to ask whether genius sheds light or darkness over the

world; it is to renew the blasphemy of Plato; it is to expel poetry from civilization; it is to deprive humanity of its most glorious attribute, its perception of the infinite; it is to fling back to the Almighty the highest faculties with which he has endowed us, lest jealous minds be offended, and the material world appear poor and little, as compared with the splendors of imagination and the magnificence of nature."

CHAPTER X.

MATTER.

Now that we have endeavored to show that ideas are man's first *necessities*, it will be well to inquire whether matter is deserving of the contempt in which it is held by some writers upon æsthetics. Hegel, for instance, classifies art by placing poetry in the first rank for being entirely disembarrassed of matter, and thence down, through music, painting, and sculpture, to architecture, which, according to him, is symbolic, sensuous and material in excess, and which hence occupies the lowest rank in art. It is not intended to advance here any theory of classification: indeed the arts as such cannot be ranked one above the other. They are all methods of expressing ideas through capacities which can only be measured when the last earthly artist has accomplished his last work: but we may fairly object to a classification which is based upon the amount of matter involved in an art effort, or to the principle implied, that matter exists in any sense in opposition to an absolute idea.

To compare music and sculpture, for instance. According to Hegel, sculpture is only less subject to matter than architecture; it stands, in that respect, below painting and still more below music, wherein all elements of space are suppressed and all is inner emotional

nature (Gemüth). To speak in terms more precise, an idea expressed in stone involves the stone itself as a part of the art work; while music is mere sound, expressing the idea as it were without the presence of matter. We see the statue by reflected light, and vision brings the reflecting matter into notice. The light image alone, however, as produced upon the retina, may be favorably compared with the sound impression upon the tympanum, if we consider merely the quantity of matter involved in producing sensation. The question may be asked, is there no matter involved in a musical production? For instance, in Handel's Messiah, there is half a ton of brass and string instruments set in motion by six tons of human musicians, accompanied by thirty tons of vocal performers, agitating ninety tons of atmospheric air; not to speak of the vibrations of the building wherein the oratorio is performed, and of the audience itself listening to the performance; among which mass we must also count the few grains of matter forming two musical instruments, present in the human ear, which musical instruments, if covered with a drop of water, would place us in a sad relation to this great sum of inner emotional nature (Gemüth), for the simple reason that we would then not hear the slightest sound of it. True, the matter involved in a musical performance may be considered as an instrument, and not as a part of the art-work itself; but this applies also to the matter contained in a statue. This becomes merely an instrument which reflects light, and which, in forming a picture upon the retina, conveys the *idea* of the art effort. But we must further examine the true relation of matter and thought in music. The Messiah brings before the

audience a chorus, a body of human beings, who are the actors in a dramatic performance representing another similar ideal body of persons who did at one time proclaim to a suffering world the advent of the Redeemer, his suffering and humiliation, and finally the great triumph of a completed redemption. It is assumed in the first part, that Christ will come; in the second part, that he has come and suffered; and in the third part, that his suffering has terminated and his triumph commenced. These occurrences in their succession have impressed certain persons who feel impelled to convey these impressions and the resulting emotions to the world. We find here a series of art efforts succeeding each other. In the first place, the poetic description of the coming of Christ, and the emotions of the chosen few who proclaim his coming to the world, as contained in the text; next, the composer translating the emotions pictured in the text into *music;* and finally, the performers, who render this music to the audience. All and each of these art efforts, however, deal with an ideal congregation of human beings who, knowing of the coming of Christ, his suffering and triumph, convey to an audience their emotions.

They are the group of human figures represented upon the stage; and though it is no part of the plot of the composer that they shall be seen by the audience, it is intended that they shall be heard; and they must be considered as the matter involved in rendering the idea in sound. And they are a part of the art representation, just as much as a certain quantity of stone is a part of a statue so wrought by human hands as to reflect upon the retina a picture not only of its physical

form, but of such motion of its form arrested at one particular moment of time as will express the idea intended to be conveyed by the artist.

Matter in some form is absolutely necessary in art, in order to conceive a statue, a picture, or a group of persons represented in a picture. If this group be painted in words, or if it be represented as expressing its emotions in sound (music), the group itself, in material form, is a prime necessity in the scheme, if it is to answer the purposes of art. The mere statement that the Son of God was born, suffered and died to redeem man, without depicting either his emotions during the act, or the emotions produced in others, is not a work of art. In fact, it is a condition of art that the conception of an idea shall be connected with material bodies; for all ideas of which we are possessed, or of which we can possibly acquire a knowledge, or which we can imagine, are ultimately connected with a motion of matter.

Matter in the apparent condition of rest (for indeed we know not of matter in a state of absolute rest)—conveys no ideas; its motion, however, suggestive of the order of its motion, is the only tangible foundation of thought. This may be illustrated by the pebble we despise as *mere* matter. Let us examine it with the microscope and find the secrets of its crystallization, and we become at once possessed of an idea in relation to it. We have learned to know a phase of motion to which the matter has been subjected at some time in the past. We are constantly in the habit of separating thought from its base, which is matter; yet it is not possible to conceive an idea without a relation to known matter. The mind is not capable of conceiving through

the imagination an ideal *thought* not directly derived from or communicated by matter. This is forcibly illustrated by various conceptions of the immortality of the soul, an idea supposed not to be derived directly from known matter. The shades visited by Ulysses are represented as eating, drinking, and conversing. The Christian idea of immortality of the soul may be summed up in the words of St. Paul, "It is sown a natural body; it is raised a spiritual body." What is more remarkable still is the human desire for immortality disconnected from the body or from any matter whatever, in the face of the fact, that no natural law is more firmly established than the indestructibility of matter; and of the fact that one can imagine no condition of existence divested of matter.

CHAPTER XI.

ÆSTHETICS.

In the preceding chapter, the nature and function of art have been discussed purely as those of a materialized idea, without direct reference to beauty as a quality of fine art and of nature. This is not the course commonly pursued heretofore. Beauty alone has been especially considered in the philosophy of art. It is assumed by most writers on the subject, that the only acceptable test of a work of fine art is whether it possesses the quality known as beauty. This inquiry is not deputed to reason but to the emotions; if, in the presence of a work of art, the subject experiences a pleasurable emotion, this is proof positive that the object contemplated is possessed of beauty, and the art work is of that class which is especially known as one of fine art, unless it be a work of nature.

The difference between a definition or demonstration and a pictorial representation of an idea in matter is not discussed; and yet it seems that such a discussion might lead to a more clear understanding of the nature and function of fine art than the constant contemplation of the mere quality of beauty, and its symptom, the pleasurable emotion. For the better understanding of the subject, however, it is deemed best before we proceed to the consideration of the

idea in art (and more especially in architecture), to devote this and the following chapters on art, architecture, and beauty to a brief rehearsal of the views held upon this subject by various eminent authors.

When we contemplate works of nature or of fine art, we experience a certain pleasurable emotion. The science which attempts to explain the nature and causes of this pleasurable emotion is called æsthetics.

Its purpose is to determine logically what special quality or element constitutes a work of art, with a view to guide the artist in its production, and the layman in a proper and just appreciation of it, and also to elicit the function of art in the social economy.

All writers upon æsthetics agree that the pleasurable emotion in the subject is the test of its being a work of fine art, and that the quality which in fine art produces pleasurable emotion is its beauty. What constitutes beauty is not established upon any one comprehensive principle; but certain relations of the work deemed beautiful to utility, to morality, to the religious sentiment, and even to the Deity are asserted, doubted, and disputed, and certain properties of works of art, such as unity, harmony, contrast, symmetry, magnitude, association, relation, and proportion, are established, and in turn rejected, as the attributes of beauty.

Some authors recognize sculpture and painting as the only fine arts; others admit also architecture, poetry, music, dancing, and dramatic acting.

The questions raised in philosophical speculations on the theory of art are mainly these: What is the nature of the emotions produced by nature and art? We find here but few attempts to define the qualities required in the person contemplating a work of art.

It is assumed, either that the subject is fully prepared to receive impressions, and to be affected by them, or that no preparation is needed for that purpose.

What is the nature of the beautiful, the quality of every object capable of producing these pleasurable emotions? Is it an essence which pervades all objects, always of the same nature, although various in its phenomenal manifestations? or, may the unity of beauty be questioned, and its presence attributed to a number of properties, which properties have this in common, that they all produce pleasurable emotions?

A work of art is held to be matter representing an idea; or, as Hegel has it, the interpenetration of matter and thought.

The German school of æsthetics does not admit an independent existence of matter, but holds matter to be the negative limiting principle in the action of self-movement of the absolute, and the beautiful a particular manifestation of supreme thought, in contradistinction to the true and the good, which are equally manifestations of supreme thought.

Socrates held, on the other hand, that the beautiful is coincident with the good, and adds another quality, viz: That the beautiful serves a purpose for the need of man.

Plato describes beauty as the soul's intuition of the self-beautiful, a reminiscence of prenatal existence, undefiled by union with the body.

When applied to beautiful objects, he renders their qualities as those of proportion, unity of parts; and then again as force, velocity or smoothness.

Aristotle ignores absolute beauty; he also places the beautiful above that which is useful or necessary.

In this we see the beginning of a later school, which has many adherents at the present day, who designate the beautiful as a quality which renders the object possessing it unnecessary—a suicidal philosophy which, if true, must close the argument forever, and make all further reflection on the subject useless. Aristotle also indicates the absence of lust in the pleasurable emotion resulting from the contemplation of art work as a leading characteristic.

Baumgarten desribes the beautiful as the perfection of sensuous knowledge, and the ugly as that which struggles against that perfection.

Kant says that art is the pleasure or pain on the presentation of an object, and beauty in quality that which *pleases* without interest in its existence, and in quantity *universal pleasure.* This has been much better said by Keats, "A thing of beauty is a joy forever."

Kant labors to reconcile reason with the idea that beauty is in itself unnecessary, by claiming for beauty adaptation (Zweckmæssigkeit), without any end being conceived.

Hegel defines *beauty absolute* as the shining of the idea through the sensuous medium. His classification of art is especially interesting, inasmuch as it defines the position of architecture in relation to the sister arts —as follows:

1st. Architecture, symbolic, sensuous, material in excess.

2d. Sculpture, less subject to matter, higher ideality.

3d. Painting, the romantic art expresses the full ideality of the soul.

4th. Music, all elements of space suppressed, all inner emotional nature (Gemüth).

5th. Poetry, universal expression; this tends to the idea elsewhere asserted that matter is unworthy, and its presence in art measurably objectionable.

To establish a sound philosophy of art, the following questions should be definitely answered. What is the *nature* of the *emotion* produced by a work of art or of nature upon the subject brought under its influence?

That these *emotions* are *pleasurable* cannot be a sufficient definition; for it is well known that there are various pleasurable emotions, the result of experiences entirely disconnected from art. *Who* is capable of emotions produced by works of nature and art, or what is the *mental quality* concerned in the appreciation of a work of art?

Mere matter disconnected from an idea (if that is possible) is not claimed to possess the quality described as beauty: hence the beautiful is to be found either in the idea itself, which proposition is at least tacitly admitted, or in the method of combination by which the idea is expressed in matter. The relation of the subject to the objective idea, and the method of the material embodiment of the idea, are the possible elements which are possessed of the property called beauty; and it becomes necessary, therefore, that the philosophy of art should distinctly define what are the ideas capable of being expressed by art work, and how they should be presented to us when embodied in matter, so as to constitute this interpenetration of the ideal and real a work of art.

If the results of an investigation as outlined here should lead to a clear understanding of the ugly, the sublime and the ludicrous; if in its theory it should explain the nature of the ideal in art and the condi-

tions of imitation of nature in art works, and also show the relation between works of art and the phenomena of nature, whereby both are possessed of the property of beauty, and produce a pleasurable emotion in the subject, it may be assumed that such a system is based upon sound reasoning.

CHAPTER XII.

ART.

Art relates to the work of man in contrast with the works of nature. The question has been raised where the line should be drawn between the two. Are not many works of man indirectly works of nature? Is the building of a human habitation to be distinguished as a mental or technical process from the building of a bird's nest or a beaver's dam; or are not the bird and the beaver entitled to the credit of producing works of art? This brings up another more complicated question: What is the difference between reason and instinct? two terms for similar mental processes, invented to express a mental and physical function respectively for man and animals, both of which tend to the same end of answering physical needs, and a distinction between which is supported only by the feeble argument, that human art manifests progress, while that of animals remains stationary. It may be urged, indeed, that the honeycomb, for instance, was probably perfect in the beginning of time, and needed no further improvement, and hence deserves to rank above similar human productions; or that we have not studied the mechanical operations of the animal kingdom sufficiently to assert that no progress has been made in any of them. Then, again,

it remains to be determined, whether moles, ants, and beavers ever deteriorated at the rate at which modern civilization has deteriorated architecture during the last four hundred years. But as we propose in this place to consider human art only, we may, with profit to our subject, abandon all these speculations, and examine into the human acts or efforts which lead to art, and omit those which do not.

1st. Fortunately it has been long established, and the theory is universally accepted, that the first condition of art work is premeditation; that all involuntary human acts, like breathing, sleeping, etc., and those which are prompted by nature for the purpose of directly maintaining the human organism, like eating and drinking, do not lead to art. It is further required that art shall be directed to the creation of an organism which, like the organic productions of nature, performs a function; or else that it shall represent in matter a natural organism, or an organism of art which, by its physical functions, betrays emotion. Inasmuch as emotions are the result of ideas, we say of this branch of art that it represents ideas in matter.

2d. It follows from the foregoing, that the premeditated transformation of matter or of material relations, for the purpose of creating objects which perform or represent organic functions, demands certain intellectual and technical powers. These intellectual and technical powers constitute art.

3d. A work of art may minister to physical wants only, as, for instance, a plough, an engine, a ship, an article of dress or furniture. Such a production is called a work of mechanical or industrial art, and the

man who performs or creates this work is called a mechanic or artisan.

4th. But if by art an idea is represented in matter, we distinguish such a work as one of fine art, and call the person who creates it an artist. To understand fully the nature of fine art, we must define the difference in the method by which ideas are conveyed in art and science. Science demonstrates the idea by definition, analysis, argument and induction, generalization and deduction. Art represents the idea as manifested through human emotions, by depicting the physical functions of these emotions. Science demonstrates the idea fully, perfectly, or not at all. Fine art may depict an idea, or represent it in matter imperfectly or partially. An idea is demonstrated by science through words or algebraic signs, or through matter and its motion, and the subject addressed by this demonstration will either comprehend it fully or not at all. A partial understanding of the demonstration cannot lead to a comprehension of the idea or an approximation to it. An idea represented in fine art may be understood imperfectly, and yet an approximate notion of the idea represented be conveyed to the subject; and, finally, an idea to be scientifically demonstrated must be true, while an idea represented in matter by art may be false, while the art work representing it may be a true work of fine art.

5th. There is outside of mechanic or industrial art and of fine art another branch of human art, which has not been specially named. Like fine art, its object is to convey an idea; but it differs from fine art herein, that the idea is not *represented*, but *demonstrated* in matter by its works. It supplies a human want as is

done by mechanic art; but it is a mental and not a physical want. It consists mainly in the manufacture of scientific apparatus, optical, electric, and other similar instruments; and the persons who do this work are called mechanicians.

6th. The methods of producing works of fine art, or of expressing ideas in matter, are called the technics of art. Premeditation in fine art involves knowledge of the idea to be expressed, as well as of the resources of technics. To paint something without a definite intention; to model in stone, build, write music, dance, or act without a clear idea of what is to be expressed, or without previous knowledge of the respective methods of representation; if all this should result in the representation of something not intended, although it convey an idea, then such work is not fine art. To draw the outline of a human figure, to paint it, or cut it in stone, to describe it with words, without expressing a mental characteristic of the person so depicted, is not fine art. It may be a correct physical representation; but, as it conveys only form and not idea, it is not a work of fine art. To prepare a geometrical drawing or a perspective view of an existing structure, or to prepare a perspective view of a contemplated structure from a series of geometrical drawings; all this is not fine art. To prepare drawings of an intended structure which, when executed, will express the idea which made this structure necessary, is to create a work of fine art, although the drawings themselves are works of mechanic art only.

7th. In every work of fine art it is assumed that some person or persons have, under the influence of an idea, become subject to emotions, which emotions

are depicted in matter by fine art. Emotions are accompanied by visible modifications of the human form, which may be termed the physical functions of an emotion. These are capable of being represented in matter by fine art, and this is the method by which fine art represents an idea in matter. An abstract idea cannot be represented in matter. For instance, we cannot produce a picture, a statue, a poem, a symphony or a monument which shall represent Religion, Patriotism, Friendship, Love, or Heroism. The impossibility is inherent in the nature of the idea, which is a perceived relation of matter, and must be embodied before it can be conceived as a subject of art. It becomes necessary in fine art, therefore, that the idea shall be expressed in an organism; that is, that some one shall do something of himself or suffer something by the act of others, or shall be in some tangible relation to a material act, and that this physical demonstration shall express an idea. It is not necessary that this act or demonstration should be directly represented by the work of art; indeed the art work may relate to acts performed by others than those whom it depicts; it may relate to past or future acts. But it is necessary that some demonstration of the idea in material action should be fixed upon and defined in order to elicit the nature of the emotions which are ultimately depicted. This process of materializing an idea, forms a very important part in art, and will be referred to hereafter frequently under the simple designation of the act illustrating the idea, or as the act.

8th. Emotions find expression in physical conditions and modifications of form. Fine art depicts these modi-

fications of physical form, and thus represents an idea in matter. Inanimate matter is capable of changes, which, by the interest which they excite in man, create emotions relating indirectly to ideas. When such inanimate matter is depicted, it becomes a work of fine art. Thus a landscape, expressing growth or decay, the effects of sunlight, motion of any kind which relates to organic development or change, when represented in a painting, or depicted in poetry, becomes the subject of fine art. Baer and Madler's maps of the moon, which represent matter at rest without organic development, are not works of fine art.

How a structure betrays emotions, and becomes a work of fine art, will be more especially discussed in a subsequent chapter.

9th. All ideas are derived from a sensuous perception of matter, its motion and relation.

10th. Organized matter, as we find it in nature, performs functions pertaining to the continuance of its atomic, molecular and organic relation. These functions are expressed in the forms of these organisms, and this expression becomes a source of knowledge. The re-creations of art also express the nature of functions, and this also becomes a source of knowledge to those who contemplate them.

11th. Knowledge derived from works of nature and of fine art presents itself directly to our senses without solicitation on our part. We see and hear, but do not examine, study or analyze; and we perceive the representation in matter of an emotion resulting from an idea to the extent only to which our powers of perception are prepared for it by previous education. We are never aware that anything more is needed on our part

to enable us to derive from the contemplation of an art work a more perfect impression; for the impression, as we realize it, seems final and complete.

12th. The intellectual power necessary to conceive a scheme of representing an idea in matter, and the technical skill required to execute such a scheme are visible in works of art more or less to every observer; and this intellectual effort to convey an idea, together with the technical skill to represent it in matter, constitute creative force. It is the creative force by means of which an idea is conveyed in matter, and our perception of this creative force is the source of the pleasurable emotion of the observer.

13th. The perceived magnitude of the creative force constitutes what is generally termed the *beauty* of the art work. To the subject observing a work of fine art, his appreciation of this magnitude of creative force is his judgment of the degree of its beauty.

The elements constituting creative force are the magnitude and force of the idea and of the act selected to illustrate it, and the technical ability displayed in expressing the resulting emotion.

14th. The pleasurable emotion experienced immediately upon a sensuous perception of a work of nature or fine art, is popularly supposed to be the result of cognition, by reason of a so-called internal sense, known as taste.

15th. Any person in the possession of his senses, whose brain and nervous system are in a normal condition, is known to experience a pleasurable emotion, a species of agreeable surprise, on perceiving an idea represented in matter.

The re-creation of human, animal, or other created

forms, of musical sounds, joyous or plaintive, the poetic description of natural scenes and of human emotions, must move any person who can see and hear to this extent, at least, that he is surprised by the creative force displayed in the production of the phenomena before him.

The exact nature of the pleasurable emotion experienced in the contemplation of works of nature or of fine art may be described as follows: Natural organisms, animal and vegetable, are alive with growth or motion; they visibly express the functions performed by them. The very existence of these organisms betrays a profound mental power, which we admire and venerate. This admiration of creative force in natural organisms is the pleasurable emotion experienced in contemplating them. When human emotions are expressed by art on canvas, in stone, in words of poetry, in music, or in architecture, the surprise at the possibility that a mental condition can be expressed in matter, awakens an admiration for the art force displayed, similar to the admiration caused by the contemplation of nature's organisms; and this admiration in all cases constitutes the essence of the pleasurable emotion caused by art.

Are these emotions the result of an internal sense called taste? To answer this question, we must first inquire whether or not objects or phenomena which are *not* works of nature and fine art do or do not produce similar emotions; and next, whether the emotions are proportionate in quantity and quality to the merit of the art work perceived.

Let us admit, at the outset, that the pleasurable emotions here considered are not to be confounded

with certain other pleasurable emotions which are purely the result of the gratification of a physical appetite. They certainly differ from these in character. This difference has been expressed by designating the pleasurable emotions aroused by works of nature and art as disinterested. But the inquiry needs still to be answered; are there not mental interests other than those involved in ideas represented in works of nature and fine art, which are capable of producing pleasurable emotions akin to those produced by works of fine art? And here we find that the contemplation of a work of mechanic art—of an engine, a theodolite, a telescope, the solution of a riddle, the demonstration of a mathematical problem, the explanation of physical laws; in fact, every demonstration which displays the exercise of mental power—also produces precisely the same pleasurable emotion in kind as is produced by the contemplation of works of nature or of fine art.

The display of skill is alone sufficient to produce the pleasurable emotion; for instance, a performance on horseback or on the tight-rope, of archery or games of skill, or even a mere display of physical strength, as exhibited in racing or lifting of weights. We must come to the conclusion, therefore, that the pleasurable emotion experienced in the presence of a work of nature or fine art, is nothing more than the admiration of the creative ability displayed; and that a similar emotion is caused by the display of any mental, technical, or physical capability in any phenomenon the result of a premeditated human act.

16th. It has been observed that the demonstration of an idea affects with a pleasurable emotion only those persons who, by education and training, are made

capable of understanding this demonstration; while all persons, whether educated or not, are capable of a pleasurable emotion in the presence of a work of nature or fine art: and it has been concluded from this that the latter, therefore, is the result of a natural faculty implanted in all men. Is this true? Most persons can tell the time without consulting a time-piece; that is, within certain limits, say within an hour or two. Is this a natural gift? No; because, in the first place, they never know the *exact* time; they are simply satisfied with what they do know; and, in the next place, the little they do know of the time is due to education. They have noticed, perhaps, the position of the sun, not by measuring it on the horizon, but by the general aspect of light and shadow upon surrounding objects. They will assure you, however, that they tell the time of the day by intuition, and they doubtless believe so. A crucial test would be to place such a person under the influence of a narcotic, and examine what he will know of time when he wakes in a dark room after a long sleep.

Intuitive taste, or natural taste, presents a parallel case. The subject sees in every work of fine art some degree of creative force, and is pleasurably moved in consequence. But, inasmuch as the amount of creative force discerned bears no relation whatever to the intrinsic creative force of the art work, the value of the sensuous perception amounts to this only, that the subject is capable of realizing that the work before him is a work of human art, and not a work of nature; and the pleasurable emotion results from this simple knowledge, and not from a just estimation of the creative force involved.

17th. The sensuous perception of matter in relation is the apprehension of an idea. This apprehension of an idea is accompanied with a pleasurable emotion, more especially if the nature of the idea contradicts or confirms preconceived ideas. For instance, we know that a ball weighing five pounds may be thrown by hand some twenty or thirty feet high; and if we should see it done, it would not produce a pleasurable emotion, because we compare it with what has been done before by ourselves or others, and we find the phenomenon to accord with past experience. It displays no special thought, skill, or physical strength. A wooden ball, weighing five pounds, is about eight inches in diameter. A ball of iron of the same diameter would weigh about seventy-five pounds. If we should see an iron ball, eight inches in diameter, thrown thirty feet high by muscular power, we should consider this an extraordinary feat of physical strength, and we should experience a pleasurable emotion in consequence.

The necessary condition precedent to this, however, is that the subject should know something of the relative weight of wood and iron, and also of the muscular strength required to throw five pounds and seventy-five pounds respectively. This knowledge, necessary to the sensuous perception which affords the pleasurable emotion, is the result of education, and not a natural gift. The pleasurable emotion experienced also differs with the education of the subject. The relative weight of wood and iron may not be correctly rated: the standard muscular strength of the human arm may be over or underestimated. Then, again, the sensuous perception may be erroneous. For instance, what

is supposed to be a solid iron ball may be a hollow one, and may not weigh seventy-five pounds. In any event, the pleasurable emotion will be proportionate to the imagined ratio of muscular force between that of the performer and an average muscular man, and not the real ratio. And even this imagined ratio is known from prior education—imperfect, indeed, but still a sort of education—and not a natural sense.

18th. The pleasurable emotion of the subject in the presence of a work of nature or of fine art, being a result of the perception of creative ability or force, the subject may overrate this creative force, or as is most frequently the case, he may underrate it, and yet he may experience a pleasurable emotion of greater intensity than that produced by another art work. But this is no proof of the relative value of the two. It may be caused by imperfect education; for it appears here, as in the physical feat related above, that the imagined creative power perceived by the subject in art work, and not the intrinsic power possessed by it, is the measure of the pleasurable emotion experienced; and this imagined creative power is perceived by the subject only by virtue of previous education. A well trained pointer will stand perfectly still the moment he sees a picture of a hunting scene wherein the game is started. To him the picture is a reality, not a work of art at all. He compliments the artist by this act, but is not supposed to realize in any degree the presence of artistic creative force; for if he did, he would know it to be a picture, and would not point. Thus when *re*-creation assumes the aspect of reality with uneducated persons, as is the case frequently when such persons visit the play, they weep and laugh with the changing fortunes

of the hero, because they imagine his joys and sufferings to be real. They experience no surprise or pleasurable emotion until apprised of the fact that what they had seen or heard was not real. There is also a false pleasurable emotion caused by false works of art. The cause in this case is, again, a supposed creative force. It is not, however, discerned in the expression of an idea in matter; for indeed there is either no idea expressed, or it is expressed very indifferently. But the subject imagines that there must be a creative force of some magnitude, for the reason that other persons express satisfaction with such a work of art. The argument of the subject is that a recognition of merit could not be attained without considerable creative power in the artist, and he is pleasurably moved by this imagined creative force.

19th. An idea, as has been explained above, cannot be directly expressed in art. It must first be materialized in the form of an act illustrative of the idea.

It needs no argument to show that the selection of the act and its material development (the emphatic bringing out of the resulting emotions) is an elementary art effort of great importance; yet to the majority of men an art work is not known to be the expression of an idea in matter. They look upon it simply as a reproduction of a material condition, and judge of it as such alone. On the other hand, it is not infrequently the case that the merit of the original art work of materializing an idea is better understood than the subsequent representation of the materialized idea, but is confounded with it and becomes the cause of pleasurable emotions, which are attributed to the representation of the materialized idea. This is very frequently

the case where a well written drama is applauded when it is very indifferently performed; or the reverse is illustrated, when good acting is received with indifference because of the shortcomings of the author. The same is the case in music. The best music fails to create pleasurable emotion, although it is most ably performed, because the audience is ignorant of the idea attempted to be expressed, or of the acts which are selected to illustrate it.

20th. Taste is supposed to be a sort of natural sense which enables men to appreciate works of fine art, and to determine their art value.

There are those who are deaf and blind, and there are doubtless those who lack that modicum of taste in which the multitude believes. But what is believed is, that taste alone, unaided by education, affords a perception of art, precisely as the senses of sight and hearing afford a perception of the presence of matter and its motion. This is probably true in the main; but the popular belief overrates the value of sensuous perception as a means of knowledge, and fails also to make due allowance for the deficiencies to which taste is subject, outside of the defects of sensuous perception; and finally ignores the fact that taste, so far as it is a function of the mind, so called, viz.: a comparison of the art work perceived with other matter which is a production of nature, is entirely the result of previous education.

A comparison of three kinds of perception, all of which are accompanied with the pleasurable emotion, will help us greatly to understand this matter.

Let us imagine our subject in the presence of an athlete, who throws iron balls eight inches in diameter,

to a height of thirty or forty feet. He is pleasurably excited by reason of an extraordinary development of physical strength. The immediate cause of the pleasurable emotion is his sensuous perception. He sees the performance of the feat, and, by comparing what he sees with what he has heretofore seen or learned of the weight of metals and of muscular strength, he forms a judgment of the magnitude of the muscular feat as executed before him, and his pleasurable emotion will, in quality and quantity, agree with the judgment formed.

We may readily conceive that the whole basis of this judgment is nothing more than prior and present education.

In the second case, our subject is proffered a problem, the solution of which involves an equation. Not being familiar with algebraic processes he fails to solve it. Another person present gives the solution without much labor. Our subject tries its correctness arithmetically, and feels pleasurably excited on perceiving that the answer complies with the conditions. This pleasurable emotion is caused by a perception of the mental power displayed by the person solving the problem.

Now, inasmuch as our subject has no knowledge whatever of the means applied to arrive at a correct result, beyond a knowledge of arithmetic sufficient to test its correctness, it may be imagined that the pleasurable emotion must be the result of a natural sense or appreciation of mathematical problems, a mental quality which to him is entirely unknown. Yet, a moment's reflection will show that this also is the result of education—the education derived from the personal attempts and failure of the subject to solve this same

problem by processes known to him. His failure teaches the fact that a mental effort unknown to him is needed to perform what to him seems a mental feat. He cannot estimate the exact magnitude of this mental effort beyond this point, that it is an effort greater than any mental effort known to him, and hence the surprise or pleasurable emotion. It is very probable that our subject overrates the magnitude of the mental power displayed; but it is a peculiarity of this and similar cases that the subject is perfectly conscious of his own deficiency, and also of the fact, that he can form no correct judgment of the mental power displayed by another person. But if we present to our subject a work of fine art, say a painting of a Madonna, he may see in it the mere representation of a woman, the picture of a mother, or the ideal expression of the mother of God, and in either event, he will experience a pleasurable emotion. This pleasurable emotion will be the result of what he conceives the painting to express, combined with his momentary impression of the magnitude of the art skill exerted to express it. Now, this estimate is, in all cases where the subject knows nothing of painting, simply the result of *this* positive knowledge, that he, the subject, is not capable of such an art effort; and to this extent the nature of the surprise runs parallel with the second case stated above. But beyond this there is a marked difference herein, that the subject has no means of testing the efficacy of the art work, like that of the arithmetical test which he applied to the algebraic problem; and also that he accepts his own interpretation of its meaning as the ultimatum of the art effort, and hence, also, as a measure of the creative force displayed. We find here not only a total

absence of conviction that he does not understand either the meaning of the painting, or the artistic skill which produced it, but a complacent conviction that he has fully mastered the subject, and a consequent belief that the pleasurable emotion experienced is the exact measure of the creative force displayed. The man who sees in the stars of heaven so much paper tinsel pasted upon the firmament, can boast of as great scientific results of his sensuous perception as the man who, in Raphael's Madonna, sees nothing but a pretty woman. And yet even this poor appreciation of the Madonna is the result of prior education, and not of a natural sense; for had he been confined to a dark cell during his lifetime, where he could see no human being, the painting of the Madonna would have left him perfectly indifferent, and there would have been no pleasurable emotion whatever. That the subject may understand the character of the mother, or may be able to appreciate the ideal of the mother of God, a long train of personal experience and art instruction must be called into requisition, and it needs no further argument to show that in this case his taste is not a natural sense, but the result of a long continued education. But when a person has a comprehensive knowledge of ideas derived from reading, study, and observation, and when he also understands the technical methods used in representing ideas in matter, we do not speak of him so much as a man of taste as a man of knowledge. We say he has studied art, he knows art. The term taste, in its popular acceptation (and we may well doubt that there is any other, for the true artist rarely talks of taste), refers to that uncertain, vague, imperfect knowledge which men acquire without knowing what they have

acquired. This is not the knowledge found in books, which gives the essence of study and observation devoted to thought, to matter, or to art; but the knowledge which comes by chance, ninety-nine hundredths of which is falsehood, prejudice, and error, derived from unguarded sensuous perceptions, together with that so-called information which others put forth who are busy raising similar crops of defective truth and falsehood. This knowledge, so unlike the genuine article that men do not know how they came by it, furnishes matter for comparison, when art work has to be appreciated not through scrutiny nor analysis, but according to a rash, momentary conclusion, which hasty conclusion becomes a standard of measure of the creative power supposed to be displayed by the work. Whatever may be the estimate of that creative power which is arrived at through these scanty means, it is still the source of pleasurable emotions; and when the subject is affected by them, he concludes that his emotions are those of taste.

We may confidently assert that the sense of taste, as popularly understood, has no existence—none at least that is of value in connection with works of fine art, or in their production. The qualifications which enable a man to form a judgment of an art work are due to education, not often premeditated education, but a sort of unconscious empirical education. This empirical education produces no good results in art, but has been a serious detriment to it. The man who only imagines he can swim, will be convinced of his error the moment he gets into deep water. He will either wade ashore or drown. The man of "taste" never finds out his error.

If we abandon taste as universal, may we grant the possession of it to individuals especially gifted by nature; that is to say, may it be admitted that these individuals understand art without having acquired a knowledge of it? To answer this question in the affirmative would imply that these persons have replaced acquired knowledge by personal observation. If so, this is in itself a species of education: but we may well doubt the possibility of this, as human life is too short to observe anew what has been observed before; and also because the most acute observer is subject to error, to eliminate which is the principal work of education.

What is true in the premises is that one man may learn faster than another, by reason of a more vigorous and healthy nervous system; but this, after all, is but a useful tool in the acquisition of knowledge, not knowledge itself.

The nature of art—and here we mean fine art—being a representation of ideas in matter, we must conclude that its function is to convey instruction. It will doubtless be objected that no artist enters the field of art with this view, nor does he pursue art for this purpose; and, also, that the outlay of mental and technical effort involved in art seems disproportionate to the result in knowledge.

It may be granted that the dissemination of knowledge is not the primary object of the art student; but this does not prove that it is not the ultimate result of art. The causes which prompt men to devote themselves to art are, like all direct natural causes, often distinct from and irrelevant to the ultimate end attained.

We eat because it gratifies a physical appetite, and tickles the palate. Very few persons sit down to dinner with the avowed object of renovating their physical organism. We learn to swim, not in order to cross rivers, but to enjoy the sensation of swimming about aimlessly.

Many become artists through an inherent love of nature, or because they desire the social position enjoyed by other artists; many because the effort involves great exertion, and they are ambitious to overcome difficulties; while others imagine the reverse to be true, and that art is an easy road to affluence and fame. The great majority believe that they are possessed of taste, and that nothing more than taste is needed to place them in the first ranks of art.

But the true artist, when finally developed, becomes a teacher and a prophet to his race, whether he knows it or not. Poetry and painting, music, the drama, sculpture, and architecture, depict emotions which, by a process of mental contagion, generate sympathetically other emotions, and thus teach men to *feel* ideas which they could not comprehend in their abstract form.

It is true that an idea may be demonstrated or defined with much less labor than it can be represented in matter by means of art; but when we consider that whenever an idea is represented in matter successfully, it lives forever, and communicates thoughts and emotions to multitudes who are in no other way accessible to them, it becomes a serious question whether, without art, the human race, in spite of the great work of science, would not sink into barbarism.

CHAPTER XIII.

OF BEAUTY.

Winckelmann, in his art history, concludes that it is impossible to arrive at a comprehensive definition of beauty. He says of beauty that it is mysterious, and that it can be measured only by its effects upon man; meaning thereby the pleasurable emotion experienced upon the contemplation of a beautiful object. Of this emotion he ventures to give a description. He says, "It begins like a gentle titillation of the skin, the precise location of which we are at a loss to discover."

Theodore Mundt, a German professor of philosophy, has written a small volume, called "Æsthetics, or, the Idea of the Beautiful and of Art Works, in the light of our own time." To give a specimen of this light, as seen by Professor Mundt, we need only to state what he conceives to be Winckelmann's idea of the substance of the beautiful. He says, "Winckelmann has resigned all philosophical comprehension of the beautiful, yet he describes very correctly its substance, which in a special sense consists in the fact that it is *everywhere* and *nowhere*."

Let the student of art wait until he feels decided symptoms of titillation of the cuticle in a particular spot which is everywhere and nowhere, and he will know that he is in the presence of beauty, the substance of which is also everywhere and nowhere, and the

nature of which is so mysterious that, by the light of our time, we cannot with sufficient clearness form a philosophic conception of it. He will then be perfectly sure that he is blessed with a vision of a true work of fine art.

It is the accepted theory that works of art and nature are possessed of a quality named beauty, and by reason of this quality they produce a pleasurable emotion. The subjective treatment of æsthetics relates to the subject as affected by the beauty of a work of art, and inquires into the nature of the emotions, in order to elicit an answer to the question, what is beauty? The objective treatment, on the other hand, inquires into the nature of beauty in the first place, and then attempts to test the success of the definition attained by applying it to the emotions experienced.

The essence of beauty is discussed as well as its phenomenal manifestations. It is questioned whether beauty can be determined upon one common property, or whether there is not a series of properties which are each and all capable of producing pleasurable emotions under certain conditions. The emotions being granted, it is inquired what is the mental quality concerned in them. All these inquiries are finally to lead us to a knowledge of the nature of art work, the source and ultimate effect of the examination.

This method of inquiry may be compared to an attempt to discover the nature of a disease by analyzing the emotions produced in ourselves upon seeing the patient, or by the study of his general appearance, or by both, without first inquiring into the anatomy of the human body, or the chemical process by which its vitality is sustained.

Winckelmann failed in describing the emotions, because he imagined that his definition must refer directly to ultimate physical phenomena resulting from them, instead of examining first the mental nature of the impression. Doubtless mental impressions react upon the body; and perhaps the process of this reaction and the consequent physical result will some day be laid down in medical works with the same precision with which we now describe the method of rolling an iron beam or boring a steam cylinder. It is very possible that the mental impression produced by beauty in art and in nature may result in nervous action akin to titillation; but when we contemplate the endless series of experiences, physical and mental, which produce similar results, then Winckelmann's definition of the emotions can only mislead us. And again, at best, Winckelmann gives us only *his* personal experience. Personal experience, under special physical conditions, cannot be accepted as a philosophical guide to art. You may see numbers of persons in front of Raphael's Madonna, in the Dresden gallery, who are subject to no emotion whatever, until told that the canvas is worth hundreds of thousands of pounds, and could not be bought at any price—which financial statement alone may suffice to throw them into ecstacies.

The emotions experienced in viewing an ingeniously contrived machine, or at the solution of a mathematical problem, a problem of any kind, of mental or physical nature,—say a fine shot around the table in billiards, the turning of a pirouette in dancing, a clever checkmate, the result of a race, and in many other performances which have decidedly no relation to beauty or art,—are doubtless so near akin to the emotions experienced in

the contemplation of the beautiful, that we can on that ground not rely upon the emotions as a guide to art.

When we contemplate the infinite variety of objects which are universally recognized as beautiful, it is very difficult to discover any one physical property common to all. With regard to form, if we compare a tree, a woman, a mountain, a cathedral, a vase, and a poem, we cannot say that these objects resemble each other in any one element of their form; and the same is also true as to their color. But when we reflect that sounds are beautiful as well as forms, we must abandon all qualities which can be perceived by special senses as possibly common to all species of beauty.

But then there may be certain attributes of art objects which are abstract qualities not relating to form, color, or sound. The first attribute naturally thought of is agreeableness. All works of nature and art produce an agreeable emotion, if not in all persons, at least in a large number of persons. Unfortunately, for this hypothesis, the converse is not true, viz.: that all objects or sounds which produce agreeable emotions or sensations are beautiful.

It is suggested by Lord Jeffrey that perhaps no object is beautiful in the abstract to all persons; but that objects bring up to the minds of some, certain human experiences with which these objects are related, which experiences constitute the source of pleasurable emotions. As every work of art is the expression of an idea, and as human ideas naturally pertain to human interests, the application of this theory is so frequently found to be correct, that it has been received with great approval by profound thinkers. But unfortunately it is the case here, as in the previous

instance of agreeableness, that the reminiscences of these human relations are frequently excited by objects entirely devoid of beauty. When Lucinda had left the room, Alfred found one of her gloves, which he preserves to this day. That glove is not a work of art.

Plato has established the principle that it is *mind* alone that is beautiful; and if by this he meant that fine art deals with *ideas* purely, and that the mental quality which enables man to express ideas in matter in imitation of nature, which also conveys in every organism of her creation an idea which explains the functions of the organism so perfectly that we bow down in admiration of the mental power manifested, we are certainly indebted to him for a leading thought in æsthetics; but we must regret at the same time that he has not stated this in terms. His definition of beauty, though undoubtedly correct and comprehensive, does not, after all, add to the stock of knowledge on the subject. He says, in the greater Hyppias, that beauty is that by which all beautiful things are beautiful.

Socrates holds that beauty may consist in the fitness or suitableness of any object to the place it occupies. This is true, no doubt, as to many art works; but especially true of a nail driven into a plank. He says that pictures and other *purposeless* works of art, when used to adorn a house, hindered rather than furthered enjoyment, because of the space they took from useful objects. This accords with the modern idea that art works are things not necessary to man.

Aristotle's views are interesting, mainly as supporting the principle that art work deals with things unnecessary (or directly useless); and also as foreshadowing the theories of Pere Buffier, afterward

adopted by Sir Joshua Reynolds, that beauty consists in a certain magnitude; it being desirable that the object, whether a natural body or a work of art, should not be too large, while clearness of perception demands that it should not be too small. On the other hand, he seems to think that, provided the whole be visible as such, the greater magnitude of an object is itself an element of beauty. Pere Buffier's construction of the theory is, that beauty consists in mediocrity or conformity to that which is most usual. When applied to animal forms, special cases would certainly justify such a theory, which is the probable reason why it was adopted later by Sir Joshua Reynolds. But it is very far from forming a theory which can be accepted as a law of beauty, especially as notions of magnitude cannot apply to music, poetry, dancing, or the drama.

Baumgarten, the first of the Germans who attempted a complete system of the philosophy of art and the beautiful, approached the truth more nearly than any of his successors. Logical knowledge, he says, has for its object, *truth*, and æsthetic knowledge, *beauty*. This would imply that beauty can be received only in opposition to truth, or, at least, that truth is not an essential element of beauty, and is so far of doubtful value in æsthetic inquiry. But he gives us a definition of logical knowledge as conceptive knowledge (begreifendes Erkennen), the act of the understanding, and its result, *clear conception;* while æsthetics deal with *conceptions not clear*, but *confused* (verworrene Vorstellungen), namely, sensuous knowledge.

This definition is valuable in so far as it determines the purpose of art to be *knowledge*. It has been objected to this mode of dealing with impressions of

beauty simply as intellectual elements, that it fails to account for the emotional results, feeling being distinct from knowledge. This would be a valid objection, if the pleasurable emotion were a result of the knowledge acquired, but, as may be shown, this is not the case. The emotion or the *surprise* is not the result of the *idea* expressed (which is truly a species of knowledge), but of the fact that by human ingenuity (art) an idea is expressed in matter, and of the mental and technical effort of the artist who has succeeded in expressing it.

The theory of art, as discussed by Schiller in his famous letters on æsthetic education ("Ueber die ästhetische Erziehung des Menschen, in einer Reihe von Briefen), deserves special consideration, not so much for the value of its conclusions (for indeed there are no conclusions with reference to either the nature of beauty or the function of art), but for the large reputation of that theory and its errors, in spite of a seemingly profound philosophical verbiage which surrounds it. Schiller reviews the sensual tendency of man, which he calls the tendency of matter (Stofftrieb) and the counteracting tendency of reason, the moral law which he terms the tendency to form (Formtrieb), which means the tendency to restrain sensuous nature within the limits of certain *forms* or laws. He takes great pains to show that these two tendencies are not in absolute opposition to each other, when in reality the one is the complement of the other, as in a clock, the pendulum is the complement of the spring, both the invention of the same mind. Without the pendulum the clock would run down in a very short time, and during that time it would not perform its functions, viz: to keep correct

time. Man is a species of clock; his sensuous desires and passions are the spring, his moral convictions the pendulum. The solicitude to continue life as long as possible, and to enjoy existence while it lasts, necessitates restraint in gratifying physical appetites; and thus the most uncultivated is willing to submit to reason, and the most refined to yield to the dictates of the senses. That in so doing, there is a constant success on one side and then on the other, or a constant attempt and failure at equilibrium, as Schiller has it, is certainly true: but it is not true, as he says, that the burden of this battle is so great for man that he resorts to art creation by virtue of a third tendency, which he calls a tendency to play (Spieltrieb), for the purpose of evading this constant restraint in a field where the restraint is not an absolute necessity, or does not exist. The creations of art are subject to the same laws as those of nature. The artist as the creator, and his audience, both participate in the human tendencies and restraints of the heroes of art production to the extent of actual joy and suffering; and no transgression against these natural laws can for a moment be indulged without detriment to the art work. Art is *re-creation;* and when the author paints his hero, he fights with him the battle of life. This hero, moreover, being an ideal hero, has strong passions and strong principles to combat; and his suffering and triumphs become those of the author the more intently as his final success is dependent upon the sympathy of the audience who sit in judgment upon the justice of the expression of this very battle, which forms the gist of the idea, the final success of a moral principle, or the punishment of a disregard of it. Hence Franz Moor commits suicide, and Fiesco is

drowned; and even Carl Moor, who sins no more than he is sinned against, must leave the stage to meet his doom.

At best Schiller's theory attempts to explain only how art came to be, and his explanation in this is not sound. The pursuit of art is not a mere (Spieltrieb) desire to play; it is re-creation, a desire to do, to work, to explain and illustrate nature's laws. The reverse is true, inasmuch as play, even with children, is a species of effort at re-creation, an attempt to do the things which are done by grown persons, and the charm of which, to the child, is directly proportional to success in approaching this result. The questions to be answered are: What is the distinguishing element in an art work which gives it place, a high place in the list of human productions? What are its intellectual functions, and whence our interest in it? These questions are not answered by Schiller.

Leveque comes to the conclusion that all beauty, in its objective essence, is either spirit or unconscious force, acting with fullness and order. We may presume the unconscious force to mean a force pertaining to the object of which *we* are unconscious to this extent—that we admit its presence but do not know its nature; which, after all, amounts to the same thing as the spirit of the object. If by spirit M. Leveque means the idea expressed through matter in the art work, we must regret that he did not say so.

Franz Hemsterhuis, a Dutch writer, speaks of reconciliation between the sensational and the intuitive systems of knowledge. This assumes intuitive knowledge to be independent of sensuous impressions, which cannot be true, and he admits as much. He says, "The

only faculty of true knowledge is an internal sense; nevertheless all true knowledge comes through the senses." And further he explains that the soul desires immediate and complete knowledge, and, being limited by its union with the senses, which are incapable of perfectly simultaneous action, strives to gain the greatest number of the elements of cognition or ideas in the shortest possible time: in proportion as this effort is successful, the knowledge is attended with enjoyment. The highest measure of this delight is given by beauty; wherefore it may be defined as that which affords the largest number of ideas in the shortest time.

Here we have great truths hidden in a surrounding of error. We are convinced, however, that Hemsterhuis dug after the truth to a purpose; that he approached it sufficiently near to feel vividly its presence, yet not near enough to analyze its nature. He evidently feels, what Baumgarten definitely states, that art deals with *knowledge*—the knowledge of ideas; not a definite knowledge indeed, but a conception, *not clear* but *confused;* or, to translate his expression (verworrene Vorstellungen) more accurately, a confused conception of a reality perceived by the senses. Now there is much gained by this conviction that fine art is a species of knowledge, a thought, an idea, a conclusion, the result of sensuous perception; or, in other words, an idea represented in matter. It is also true that the soul desires immediate and complete knowledge; but it is not true that the soul (by which we must suppose Hemsterhuis to mean the ultimate arrangement of facts perceived by the senses, and elaborated into an idea) is limited by its union with the senses, which are incapable of perfectly simultaneous

action. The senses are the instruments of the process which is completed in the brain. Without these instruments the brain could not procure the elements which must form the hypothesis of all action. We may as well say that the quarry-man who desires to separate a part of the rock, is encumbered in doing so by his wedges and drills and hammer; that these tools are incapable of perfectly simultaneous action. The tools would act simultaneously and instantaneously if his arm were a trip-hammer of sufficient power to do the work without a perceptible lapse of time. Nor can it be said that the senses do not act with sufficient rapidity to keep pace with working of the brain. It is the brain which retards the process of perfect cognition by the work imposed upon it in rehearsing a large series of sensuous impressions realized elsewhere and at various previous times, which are needed to help it to a final and truthful conclusion more or less complete. When we look at the sun, we see it instantly as it presents itself to us in its environment of distance. We see a disc of light, and, in the absence of all further knowledge or previous sensuous impressions bearing upon the subject, either had by ourselves or communicated to us by other persons, the idea arrived at would be simply this, that the sun is a burning disc suspended conveniently near to light the earth. This is the sum of the confused knowledge we should possess of the sun, and it would be derived entirely from our sense of sight.

A just appreciation of the magnitude of the sun involves the knowledge of a long train of facts observed also by the sense of sight which bear upon the complicated investigation of the transit of Venus. Now

the understanding of a common observer of the sun does not contain a repertory of all or perhaps even the leading facts of distance, velocity, time, etc., as observed of the relative position of the sun, Venus and the earth; and though his eyes act with sufficient rapidity to see the sun as it appears, the understanding, the brain, or the soul can draw no just conclusion as to the distance, size, and form of the sun, by merely looking at it. Parental love, to be understood in all its phases, needs the relation of innumerable facts, as perceived by the senses, arguments from these facts, and a statement of sound conclusions, in order to convince the uncultivated understanding of the magnitude of the interest of the parent in his child. To produce an adequate impression upon the mind of a person not prepared to understand all this, needs time, attention, and the exercise of certain abilities, both on the part of the instructor and the instructed. A *picture* of the return of the prodigal son not only develops at once all the facts in the case, but exposes the principles, the sentiments, the virtues, vices, and repentance illustrated by the actors in the picture, and permits the beholder to see at once, with very little intellectual exertion, the facts, the arguments, and the conclusion contained in that simple legend; and affords him the agreeable sensation arising from the successful technical and mental effort of the artist who produced the picture, and who thus expresses in a manner to be seen at a glance, this whole history with its moral lesson hiding and yet plainly revealing a series of arguments, which are made apparent to the beholder.

All this is the gratification of the soul, as Hemsterhuis has it, which desires immediate and complete

knowledge; but it is through the exertion of the senses alone that the soul desires or can obtain this knowledge, but not by its own exertion; hence the senses do not, as Hemsterhuis thinks, limit the soul by their union with it by reason of inability to act simultaneously; but they are the factors which perform the whole of this intellectual function. We cannot entirely disapprove of his final definition of beauty as "the element, which in an object affords the largest number of ideas in the shortest time;" but we should certainly modify it by stating that the ideas need not be, in fact rarely are, numerous; on the contrary, works of fine art almost invariably deal with but one idea; nor can it be said that the revelation of an idea in any other manner in a short time is necessarily a work of fine art. But this is true, that when an idea is so represented in matter that we can recognize its nature without serious exertion of the mind, by a mere sensuous effort, then this representation of an idea in matter may be said to be beautiful. Whether this, however, is the best definition of the nature of a work of art and of its essential merit will appear further on.

Lord Shaftesbury believes that the beautiful and the good are combined in one ideal conception; also, that matter in itself is ugly. We cannot accept this as a sound logical statement, inasmuch as it speaks of the beautiful and the good as two entities, which are found to be united in one idea of conception; hence it must be possible for the beautiful to exist without the good, the good not being necessarily an element of the beautiful; which is probably the reverse of what the writer intended to establish. The assertion that matter is in itself ugly, means probably that without a combination

with an idea it is not beautiful, which does not establish the fact that in that condition it is ugly; for ugliness, indeed, implies the *presence* of an idea *imperfectly* rendered in matter. He says, further, the order of the world, wherein all beauty really resides, is a spiritual principle, all motion or life being the product of spirit.

Rain is the product of clouds; but it would not be true to conclude for that reason that the clouds are the source of all water: on the contrary, clouds are a temporary condition of water.

We know something of matter, its motion, and the order of its motion. It is suggested, however, that this order is a law or principle which emanates not from matter in motion, nor from its relation to other matter, but from a source which is not matter at all, which is called spirit (an entity not matter). All we know of spirit therefore, assuming that our speculation is knowledge, is that it is the property of spirit to determine laws of motion (principles of motion). We further know that these laws of motion are eternal; the function of the spirit has ceased, therefore, at the time when the laws were established, or at the beginning of eternity (a period of time without end). All this must lead to the conclusion that in this long train of argument the last link which may be definitely grasped is, that the motion of matter is life, and that the laws of the motion of matter, which Lord Shaftesbury calls the order of the world, comprehend that which we call the beautiful; which says no more than that the beautiful, not unlike that which is not beautiful, conveys an idea of matter in motion, and is for that reason beautiful—a definition which refutes itself by asserting that the distinguishing feature of the beau-

tiful is the property of all things which move in this world.

He tells us, also, that the principle of beauty is perceived, not with the outer senses, but with an internal or moral sense (which perceives the good as well). This perception affords the only true delight, namely, spiritual enjoyment.

It is very difficult to comprehend anything that is perceived otherwise than by the senses, even a principle, which is the recurring relation of phenomena as perceived by the senses, or to grant superior value to internal perception over the external.

If our eyes were covered with a skin resembling that which covers the rest of our face, with this exceptional quality, that it were transparent from within when the light impinged on the outside of it, but absolutely opaque to reflected rays impinging on the inside of it, then the sense of sight would become an internal sense. A mental impression of an object seen in the past differs in no way from the fixed picture on a sensitive plate exposed in a camera, except in the process, which is evidently not photographic, inasmuch as a verbal description, or the touching of an object will and does reproduce the permanent impression equally well. But whatever the process, the perception itself cannot be ranked higher than any other sensuous perception, either because the process affects tissue invisible to us, or because we do not know how the tissue is affected. The moral sense, so called, is nothing more nor less than the consideration of our own physical interests from that particular standpoint where we see ourselves as a part of the universe; it is more comprehensive than the mere function of our eye

when it perceives an impending blow; it presupposes the sensuous perception of a series of physical phenomena pertaining to ourselves and others, and the universe, and on that account being nothing more than a series of sensuous experiences applied to human physical conditions. Nor can we assert that moral considerations exclusively contemplate the good so called, inasmuch as the recognition of the good implies a contemplation of the opposite, or the bad; more especially as moral law pertains to the avoidance of evil as well as to the performance of that which is good. It is even so with what Lord Shaftesbury calls spiritual enjoyment, which is nothing more than a physical enjoyment in anticipation or in retrospect. Nor can we in all this find a definition of the beautiful, nor of a work of fine art. Lord Shaftesbury's distinguishing order in which he expresses the three grades of beauty, do not help us in this matter any more than his other arguments and explanations. They are as follows:

1st. Inanimate objects, including works of art.

2d. Living forms which reveal the spiritual formative force; and

3d. The source from which these forms spring—God.

Speculation as to conditions of form which constitute beauty are very numerous. Magnitude, it has been asserted, is an element of beauty; and so it is in so far as it indicates dignity in a structure, or power in a mountain or a cataract: but in a human nose it would tend to the ugly, either because it is a mass of matter not needed to perform a limited function, or because the function performed by it indicates defect-

ive organization in some other part of the human body. In the negro a certain excess of nose (as considered from our standpoint) is not ugliness, because in his native country that organ must admit a much larger measure of atmospheric air at every inspiration, on account of the expansion of the air by heat. Hence a negro woman may be considered a beauty in her own country, and decidedly ugly in a colder climate. Objects which are soft to the touch, and according to others those which offer a moderate amount of resistance, are held to be beautiful on that account. It is very difficult to ascertain what special objects are referred to. If a certain rigidity is of that degree which responds to the functions performed by an object, there is no doubt that it becomes expressive of those functions, and constitutes for that reason an element of beauty. Nevertheless, conditions of density of matter cannot be accepted of themselves, and in all cases, to be a property which determines beauty. Certain lines have been accepted as beautiful, and objects presenting those lines in their contour have been pronounced to possess the property of beauty on that account. Hogarth's line of beauty has furnished æsthetic stock in trade to the artists of his time, and is now glibly spoken of by amateur critics and laymen. In the human form, this line is often expressive of the functions performed by the parts; yet others, endowed with a curvature of that description, would be pronounced decidedly the reverse of beautiful, even by Hogarth himself. And parts of structure which resist strain are, no doubt, subject to the same ruling, on the ground that this line is often inconsistent with a just expression of the functions performed.

Proportion, as commonly understood, is probably the most delusive attribute of beauty. All objects, beautiful or the reverse, are possessed of a quality which may be designated a relation of parts or proportion. To constitute beauty, therefore, a precedent condition, requires that the proportions of part of an object should be just. How are we to ascertain that these proportions are just? The answer is, when the object is beautiful. And if we ask the further question, when and under what conditions is an object beautiful? the answer is, when its parts are proportionate.

This endless circular argument has further resolved itself into a circle of three links instead of two, viz.: beauty excites a pleasurable emotion; hence, when in the presence of a work of art or of nature, we experience a pleasurable emotion, we know that the object is possessed of the property known as beauty, and, hence, that its parts are proportionate. But we know that the so-called pleasurable emotions are by no means a sure guide to art, inasmuch as pleasurable emotions are often due to other causes; and, also, that their intensity depends as much upon the nature of the subject in whom they are excited, as upon the object exciting them. Hence the pleasurable emotions do not assist us in determining either the beauty, or the value of existing proportion in an object. But if the proportion of parts relates to their functions as members of the whole, then we certainly can resort to mechanical and anatomical considerations capable of mathematical demonstration.

Père Bouffier's idea, that average magnitudes constitute beauty, can apply to the animal creation only, and merely expresses the sentiment of Pope, "Whatever

is, is right:" but it cannot be extended to art works or to natural scenery; as a mountain exceeding twenty-eight thousand feet in height, or the trees of the Yosemite valley would become decidedly ugly.

It has been suggested that the idea of beauty grows out of an interest in human relations; and, furthermore, that art-works deal exclusively with these relations.

It has been ingeniously urged that natural beauty, say the beauty of a landscape, is to be found in its adaptability to a possible human dwelling-place: hence the dreariness of a desert. But all this does not account for the beauty of the lion, the tiger, the inaccessible crevasse, or the volcano.

If we pursue the definition of a work of fine art, viz.: that it is an idea expressed in matter, we shall have no difficulty in understanding clearly the exact nature of beauty. Fine art is a species of human short-hand by which the hypothesis, the argument, and the conclusion pertaining to an idea (which is a relation of organized matter), are at once presented to us; and, whether we thoroughly understand it or not, our senses convey to us a more or less perfect picture, capable of producing an impression, proportionate to our understanding, indeed, but within that limit perfectly complete.

A logical demonstration of the same idea in words, in definition, explanation, argument and conclusion, contemplates a certain amount of intellectual preparation proceeding through a variable length of time. During this time we are called upon to entertain thoughts, relations, principles in which we have no perceptible interest, until their relation to the final conclusion is reached; and then only if we have followed

the argument throughout, and have fully succeeded in mastering it. This process is tiresome to the mind, and but rarely successful. But in art work, or in a work of nature (which is an idea presented in matter), we can, at a glance, take in the whole scope of this idea; not, indeed, to the extent of its full import, but to such an extent as we are prepared intellectually to realize. The very first result of such a sensuous perception is an idea brought to our mind, as it were, by simply looking at it, or by listening to it, and before we have fully realized the scope and import of it, we are impressed by the magnitude of the mental effort capable of creating such a work of nature, or of art. The dumb thing speaks to us, and we are delighted to find that it can be made to speak; and we say that it is beautiful. Now, it does not matter whether it speaks to us in the soothing tones of love from the laughing eyes of a Cupid, or in the thunder notes of a cataract, a volcano, or a storm. This knowledge that it is matter which is addressing us, prompts us to admire the mind, the force, the dexterity which can make matter speak to us; and when we say it is beautiful, we mean by it that the successful effort to express an idea in matter is beautiful. The idea itself may be hateful to us; we may even fear and dread it. Take hell, for instance, with all its horrors. When Dante pictures it to us, we love and admire the picture, and deem it beautiful: not because it is hell, but because it is a creative triumph of human ingenuity to present a picture of hell, the idea of eternal torment expressed in matter, whether it be presented on canvas or in words. Now it must be remembered as more especially important that this admiration of the creative mind refers to mind

in the abstract; not at all to the author of the art work, or to God, the author of natural productions. We admire the force whatever it be (call it mind, dexterity, skill, anything.) which imbues matter with a *meaning* so that it may communicate to us what it is itself doing—how it came into existence, how it is sustained in life, or what are its functions, its habits, and its probable end; as is the case in works of nature, and as is the case, also, in art work, when it speaks to us of human relations with humanity, or with the universe outside of humanity.

Nor do we reflect especially upon the idea communicated when we pay this tribute to the creative force. It is indifferent to us whether the idea be one to excite pleasure or pain, whether it present to us a picture of virtue or vice, whether it treat of the heroism or the follies and foibles of humanity: in every one of these cases our tribute to the creative force is one of pleasurable excitement. Now the work of the creative force, as seen in nature or in art, is the beauty we talk about. The success in making matter speak, or sing, or dance, so that it conveys an idea by its expression, constitutes beauty; and the degree of expression, considering the environment of the idea expressed, and the nature of the matter in which it is expressed, constitutes the degree of its beauty.

Now this is worthy of being more closely examined. Are beauty and expression convertible terms? Certainly not. Beauty is the measure of creative force in the abstract. Expression is the result of creative force contemplated as dealing with certain given ideas and certain given matter in which the ideas are to be expressed. The nature of the idea, its tractability, and

the nature of the matter employed, become elements in the final expression. For instance, the difficulty of expressing the same idea must, with a given quantity of creative force, increase with the nature of the matter employed somewhat in the following order:

1st. A picture produced by dramatic action upon the stage.

2d. A picture in words.

3d. As expressed in a statue.

4th. Upon canvas.

5th. In music; and, finally,

6th. In an architectural monument.

Or, again, the quantity of matter employed in one, and the same method of expressing an idea becomes an element of expression, as may be readily seen in these two problems; a colossal Cupid and a statuette of Jupiter.

In nature, where the creative force is infinite, the other two elements which, in connection with it constitute the measure of expression, become so insignificant that they may be safely neglected; hence in natural phenomena, beauty and expression become identical in quantity, if not in meaning.

A natural organism which fails to perform the functions intended, or an organism which performs functions inferior to the standard of excellence known to us as the functions habitually performed by similar organisms, is called ugly.

When such an organism is represented in matter with premeditation,—the object being to convey the notion of a fallacious idea,—this is a work of fine art; the object represented is *ugly;* and the art production (if successful) is *beautiful* at the same time. This

condition of things illustrates forcibly the relation of the beautiful, the ugly, and of art expression.

When the functions successfully performed by a natural organism or an art object transcend functions habitually contemplated and known to us, such a work of art or of nature is said to be *sublime.*

When an organism in nature or art falls short of a due performance of function to a limited extent, it is *ludicrous.*

The popular saying, that there is but a short step from the sublime to the ridiculous is a popular error; for the reason that there is a difference in the degree of function to be performed, as well as in the success of performance. The sublime contemplates the full performance of a transcendent function; the ludicrous falls short of a normal function.

An object of nature or of fine art to be pronounced ugly, must possess all the features, parts of structure, or functional parts needed for the full performance of the function; but in a degree either in excess of, or insufficient, or rudimentary in force or quality, to make a successful performance of the function possible.

An object of nature or of fine art to be pronounced ludicrous, must, in its organism as a whole respond to the function it is intended to perform; but must fail to do so essentially and clearly in some direction, in some one feature, part of structure, or functional part. And this failure must arise from an insufficiency of force or action, and not an excess of it.

In a work of fine art representing the ludicrous, we again find the possibility of co-existing perfect beauty and imperfect expression.

CHAPTER XIV.

THE IDEAL AND IMITATION.

These are terms constantly used in æsthetics, but rarely understood and very often misconstrued.

A current error is that the ideal is the opposite of reality, and that the artist, to give dignity and value to his work, must mend the reality which he essays to depict according to a standard prompted by his own sense of what this reality ought to be ; it is a species of misrepresentation in the interests of art and sometimes of artists, which has no foundation in the nature of art, and leads to no art results. Often this idealizing process refers merely to a change of the physical development of the object to be presented. This is more especially the case in portraiture on canvas or in stone. The current talk of idealizing human features, forms, and costume, leads at once to the examination of portrait work, and the resulting inquiry to what extent it may be recognized as fine art. Fine art is the representation in matter of an idea indirectly through the direct representation of an emotion. Unless the aim of the artist in a portrait is to delineate one or more prevalent objective emotions which through frequency have become habitual, and have imprinted themselves on the features and figure of the original, the work produced is not a work of fine art.

Another current error is, that the function of the ideal in art contemplates the representation in matter of ideas or acts which exceed those found in nature; that we should depict heroism, piety, devotion, love, etc., greater than any heretofore known in history, or that we should invent forms which manifest and express given ideas better than the forms of nature can express these ideas.

It may well be doubted whether this can be done; and, if it could be done, it would be inconsistent with another fundamental law of art, viz.: imitation, which prescribes limits incompatible with such an attempt.

If we refer to the definition that art is the representation of an idea in matter, and that, further, the artist must, in order to represent an idea, select an act illustrating it, and an emotion which results from this act; that he must in his art work represent this emotion; and, farther, that the success of his creation depends upon his technical skill in executing it,—it becomes evident that in the selection of the act and the resulting emotion must be involved the idealizing process of the art work: and this is really true.

The emotion to be represented in matter determines the technical skill required to represent it; and the greater the technical skill the greater the art force displayed.

The ideal which the artist selects determines the intricacy and difficulty of the work he has to execute. An example enables us to see this more clearly. Charity, for instance, is an idea illustrated by the act of giving to the poor, or by an emotion of sorrow arising from harsh judgment expressed in our presence. A gift to a ragged cripple, the widow's mite,

are typical instances of charitable action. The emotions caused by these acts find expression through physical functions. Sorrow at the uncharitableness of others is an emotion of which the physical functions are infinitely more difficult to apprehend and also to express in matter, than emotions resulting from the mere giving of alms. In the latter case, the act itself becomes an illustration of the emotion; in the former, the physical functions of the emotion demand subtle analysis, and can be expressed through matter only by consummate technical skill.

The more exalted the act which illustrates the idea, the more difficult is the problem of rendering the resulting emotions in matter; and the greater must be the theoretical knowledge and technical skill of the artist to fully and clearly tell the story he desires to communicate; and hence the greater the obstacles to success.

The common notion that the ideal in art is opposed to the real in nature will now become apparent. The woman who has lost her child may be represented on the stage, shrieking in front of an edifice where the child is supposed to be. She may cry and tear her hair. Is this a phase of fine art? Yes, certainly; but of an inferior degree. Neither author nor actor shows much creative skill in making the idea apparent. The mother's grief is true to nature, but formed after a rude and low ideal. It is a grief of so demonstrative a character, as to need no art to make it apparent.

Mary Stuart is represented by Schiller as meeting her death calmly. She does not dwell on herself or on her doom, but admits her transgressions, and exonerates herself from false accusations in the fewest

words; she speaks long and lovingly of the services of her friends; and expresses her regrets at parting with them, more in their interest than in her own. Observe how the ideal of the author, manifested through the acts and emotions of the Queen, illustrates the idea of grief at approaching death, in the most poetic and exalted manner, and also with perfect truth to nature.

The selection of the act and of its resulting emotion to illustrate an idea in fine art, constitutes the ideal.

Imitation in art is commonly understood to mean the copying of nature's forms as we find them. If it meant this and nothing more, it could have no application to architecture and music; and but a partial application to poetry and dancing. But it means more than this: it means that in the creations of art we should imitate the *methods* of nature in modelling her organisms, by which these organisms are endowed with an expression of the functions which they perform. In other words, nature's laws in modelling organisms apply to the ideal organisms of art as well.

Art deals with ideas (relations of matter). Nature also deals with relations of matter. Whenever we observe a temporary relation of matter in nature,—and all relations of matter are temporary,—the duration of this relation becomes of interest to us, and we inquire diligently into its origin, its development, and final dissolution. A plant, an animal, are aggregations of matter in relation; and every phase of their existence, be it development or decay, is a function of this special aggregation of matter. We watch these functions from various standpoints. We observe the mechanical work performed, the elements which compose the organism (its atomic constituents), the division and

sub-division of organic constituent parts, its general form. With regard to form, whether it be the general form of a complicated organism, or the form of its members, down to the form of elementary cells, we everywhere find expressed in that form the function performed by the organism. This expression, art is to imitate. How is this to be done? Common sense answers: Take this natural form as a model, and imitate it. Common sense here, as elsewhere, is over-confident.

In painting and sculpture, as far as these arts deal with natural forms, the copying process would, of itself alone, be insufficient. In architecture, poetry and music, ideal forms must be developed, as there are none to be found in nature. To paint the animal form, means to paint the skin as affected by the motion of the skeleton and the muscles of the animal. To know exactly how the form of the animal is affected by its internal mechanical apparatus, it is necessary to know the form of the parts of the machine; that is, the form of the bones and muscles; and, also, the mechanical laws in obedience to which these bones move when acted upon by the muscles under the influence of the nerves, which are directly affected by an idea or a physical desire to move. The modifications of animal form under the influence of motion or emotion, are too subtle to be readily seen by looking at them; although it is true that much may be accomplished by long continued and attentive observation. The sculpture of the Greeks, who lived in the presence of the naked human form, serves as an illustration of this. But when we pass beyond the limits, within which art deals directly with natural organisms, it must be evi-

dent that imitation must be directed first to acquiring a knowledge of the mechanical laws of nature.

Such a knowledge enables the architect to construct the skeleton of a structure, which, in the form and relation of its parts, shall be abundantly competent to resist that disintegration which in all statical organisms proceeds from gravitation, and the disturbing influences of atmospheric action. It enables him also to determine how much of this structural skeleton must be betrayed in the visible form of his monument, in order to convey the assurance that stability is its first quality.

Imitation of nature in art may be examined from another standpoint. Art is a species of creation, which creation we must learn from nature; and when we have learned it, we must diligently apply what we know. Nature's organisms are the result of environment. Elementary substances aggregate into organic forms, whenever these substances suffice for the renewal of an animal or vegetable organism. Conditions of relation are maintained by the functions of assimilation, of elementary matter, and of reproduction of kind. Reproduction and assimilation are carried on by special organs provided for that purpose, and organs of motion are supplied to reach the elementary matter needed for renewal. All this is accomplished with an outlay of matter just sufficient for the purpose: there is nothing superfluous, and no deficiency; the economical employment of all the matter used and brought into action, determines the form of the organism. It is not surprising, therefore, that an organism determined by environment, continuing under the conditions of the same environment, and free from superfluous matter, not needed for the purposes of continuance, or in places

where continuance is not furthered, should be possessed of a form indicating everywhere the nature of function, and hence should be possessed of the quality of expression in an eminent degree.

To imitate nature in art, therefore, cannot mean merely to imitate her created forms, unless that is the special problem of the work of art; but to apply to art the laws by which nature's forms are created,—and this means, to study the environments of the thing to be created, to supply matter to meet these environments not only with sufficiency (in abundance perhaps), but in the right place, in order that the aggregation of matter, when the organism is completed, shall not only perform its physical and ideal functions, but shall by its form everywhere tell the story of these functions, and demonstrate its efficacy to perform them.

The painter, the sculptor, the poet, and the actor, as a rule, seek for models in nature. At the same time it must be observed that the poet does not present his heroes in the form in which he finds them in nature, but portrays ideas of them in words. Words are a method of natural expression, but poetical word-painting varies so widely from common expression in speech, and in this direction so far excels nature's models, that we must recognize in it a new form of art expression, not directly found in nature but growing out of nature's principles. Speech depicts matter through description and definition, which involves an analytic and synthetic examination of matter. Poetry uses words to depict the forms of matter under the influence of emotions, and permits us directly to perceive these emotions. Poetry, moreover, uses impassioned language: which, by reason of its earnestness, becomes

metrical, a method of which we find indications in human intercourse; but which, in poetry, transcends the limits of lingual expression. When, however, we contemplate the arts of architecture, music, and dancing, we find *no* model in nature which they directly imitate. It is true that among the children of the forest, persons living as it were with nature, like the peasant and the sailor, we find the outgrowth of native impulses in a species of dance, expressive of certain emotions; but it cannot be said that the ballet is an imitation of these forms. On the contrary, though it imitates the principles involved, it exceeds the ideas and methods in the same degree which obtains in the case of poetry. The ideas represented, and the forms used in the ballet, are of an order far higher than those to be found in nature. This is also the case in music.

Architecture absolutely finds in nature no forms whatever which it can directly imitate. This is generally admitted, and has been discussed abundantly. But it needs to be mentioned here, that while the subordinate parts of architectural forms, and the architectural decoration of surfaces are composed of forms borrowed from the animal and vegetable kingdoms, whenever this borrowing is done, modifications of the natural form become necessary for two reasons. 1st. These animals and vegetables are called upon to perform functions, which they never performed in their natural condition; and, 2d, they are translated into a material (stone or metal), which is not the material of which nature formed them originally. The question must be answered: "If nature attempted to produce a leaf which should be stony in its aspect, and perform mechanical work, how should its actual form be

modified to express both the function and the material?" This process, of modifying the character of natural objects, in form and in color, in order to adapt them to new material and new functions, is called conventionalizing natural forms, and unless natural forms are so conventionalized, they cannot be admitted as productions of fine art.

The application of the principle of imitation to architectural art, so far as the arrangement of monumental masses and their functions is concerned, must be confined entirely to the observation of nature's mechanical laws. These alone must form the basis of architectural imitation of nature; and without them imitation becomes impossible, and architecture ceases to be a fine art.

CHAPTER XV.

SCIENCE AND ART.

KNOWLEDGE is the echo of the questions asked of nature. To formulate the question is to create the germ of the answer. The answer is wise or the reverse, true or false, in accord with the question asked. It is not surprising, therefore, that the questioner is content with the answer received.

Heat, electricity, light, magnetism, attraction, chemical affinity, cohesion, are names shaped into responsive formulæ, which, so long as they fail to define tangible material conditions, add of themselves nothing to our intelligence. Jupiter, Vulcan, Diana, Venus, are similar echoes of metaphysical questions. These gods embody causes and forces which are not referable to human or other material agency, and are formulated in human forms endowed with recognized but untraceable energy of force. Force, so far as it is known to man, must be defined as an *unexplained condition of matter.*

When a phenomenon can be traced to another phenomenon preceding it, the latter is termed a cause, and the former an effect. The nebular theory of Laplace will continue to command scientific attention as long as strong reasons in its favor are observed to exist, and its absolute truth is *not* firmly established.

Let this be once done, and the human mind will revert immediately to the probable condition of matter preceding its gaseous state. Cause, as far as known to us, means a preceding phenomenon, and nothing more. That we have no knowledge whatever of abstract force or cause has become a scientific axiom recognized by all.

Current discussion is concerned with unseen intelligences, such, for instance, as the human will, which is believed to be an immaterial cause of material phenomena. This means, in other words, that abstract force disconnected from matter may exist independently of it, and may endow it with motion. According to the law of continuity, this leads to the conclusion that matter in motion acting upon nothing whatever, may at the expense of its own motion endow this nothing with latent motive force to be expended upon other matter at a convenient time; or perhaps that foot pounds may exist independent of matter. On the other hand, it has been demonstrated that physical action is itself an expenditure of material motion equal in quantity to the motion of the matter involved in work done, and that the will, therefore, is nothing more than a directing agency, and not itself a force. The human will may direct muscular force to the end that it may build a steam engine, or to the end that it may break into useless fragments another steam engine already built. This choice of action is the faculty known as will. The question may be asked, then, Is the will a directive force or an intermediate link between material phenomena? The motive for manufacturing an engine is directly traceable to a desire to maintain or advance the interests of

human life. To destroy a steam engine is an indirect method of shortening human life; the former act is rewarded by society with a draft upon human resources, the latter with the punishment of a corresponding loss. Human will, therefore, is an intermediate condition between an expenditure of muscular force, and a renewal of the same; in fact, nothing more than a relation of matter and its motion in the form of a perception, and is, therefore, an idea similar to that of a mathematical fulcrum of two bodies revolving around each other in space, a point without either substance or motion, neither an effect nor a cause. Will is the resultant of present appetites and future necessities, of personal desires and social needs: it is the center of equilibrium of many forces, but is itself not a force. The question will be asked, if the will is no factor in human action what is the cause of human success and adversity? The answer is, that this may be found in a well or ill-balanced brain and perceptive ability of the senses; or, in other words, in physical condition as determined by the environment of previous generations and personal training. The man who gorges to satiety, and who drowns his senses in wine, has a will in which physical appetite predominates over future necessities, for the reason that the latter are not as tangible to his perceptive faculties as the former. It must be remembered that the will is an idea, a rapid conclusion regarding a complicated relation of matter, which relation becomes obscure to an ill-trained mind in the degree of remoteness of interest, and not in the degree of apparent relative importance.

Interests of the human race, of the State, of the

community and the family are of paramount importance to the individual compared with those interests which directly affect the momentary well-being of his person. Interests pertaining to the future are of the same and often of greater value than those which concern the present. But the perceptive faculties of men are dulled to a proper appreciation of their importance: hence society has been ever busy in introducing artificial conditions which are interposed between seemingly remote human interests and the immediate perception of them. These are social regard or contempt, distinction or degradation, by way of reward or punishment, and such teaching as can be conveyed to man by depicting human relations, by art. All these furnish to the individual such intellectual help as he is capable of utilizing.

An impending blow is promptly perceptible to the dullest comprehension, and the will of the most obtuse acts with alacrity to ward it off; or, in other words, the sensuous perception of an immediate physical injury is followed by a physical act to avert it, and the point of intersection of two conditions of matter which must result in personal injury is here termed human will. To give a blow to another must ultimately result in personal suffering to the aggressor; but this fact is not so apparent, and needs elucidation by way of preventive. Fear of the punishment imposed by the law, and of the contempt of his fellow man, serves the purpose of such elucidation. To control passion, however, man needs training, and this training is to be found only in philosophy and art, and for the majority of men only in the latter.

Philosophy deals with the why and wherefore, the law

which governs phenomena. Art deals with human ideas, which it represents in matter. Human ideas comprise answers more or less complete to all questions asked by man. The mathematician admits unknown quantities, as x and y, in his computation, without an immediate inquiry into their nature. When his equation is finally solved, the exact value of x and y will doubtless appear; but in the meantime they are admissible elements of a mathematical argument. Metaphysical ideas are often relations of x and y, or powers of known quantities, which must needs serve the human understanding in this form, to be solved or not hereafter, as the case may be. In the meantime, instead of mathematical notations, they are formulated in pictures of material relations, wherein, perhaps, the nature of the matter forming the relation, or the relation itself, or both, are unknown quantities. It is a gain, however, to know that a relation of something does exist; and even if it should finally prove to be true, that neither the matter nor the relation is a fathomable quantity, or that one or the other of them has no existence in fact, this knowledge in the meantime serves the purpose of an intellectual crutch to the man who imagines that he needs one to walk faster than he could by the mere use of his legs.

It is the problem of science to simplify laws, to search for those laws which have the most universal application, to show the relation of different laws, to make reference to law practicable and easy. It is the province of art to multiply forms, and to surround men with their influence. Science helps man to think correctly; art attempts to spare him the trouble of thinking, by presenting to him thought embodied in material

representation. Science is the intellectual capital which enables man to live mentally on the accruing interest; art is the accumulated interest of ideal and technical knowledge to be enjoyed by the masses at every step of their lives. Science models the human brain into a well defined serviceable mental tool. Art environs that same brain with a series of pictures which are intended to occupy it to the exclusion of its own impotent working. Science and art are both intent upon securing the welfare of man, and enabling him to live long on the face of the earth. Those who practice science and art live together in peace and mutual respect. Each recognizes the value of the efforts of the other, and both are too busy in their own way of serving mankind, to spend much time in considering which method is the more beneficial; and whenever such an inquiry is instituted by either party, it results in the conclusion that science and art are equally necessary to man.* It cannot be said that the community at large entertains opinions materially differing from these: at least it is not often that such opinions find expression in words. But the acts of men certainly do not point to a universal understanding of the nature and function of both science and art, and more especially of the latter. The lack of this understanding often results in controversies, which at one time were very detrimental to human interests, but which at the present time, fortunately, are only curious and interesting. Religion, for instance, has heretofore been considered a simple faith; a belief in certain ideas which it demonstrates by means of art. At the present time re-

*See Helmholz on Classical Education, for instance.

ligion seems to doubt the efficacy of art, and to combat the potency of science. She has ceased to paint pictures which may effectually illustrate ideas which cannot be philosophically defended, in the slender hope that her truths must be capable of scientific demonstration, simply because they are truths.

Science devotes itself to the contemplation of matter and its motion, ignoring all outside of this as illegitimate subjects for scientific inquiry. Science justly claims, to a limited extent, a positive knowledge of the nature of matter. It further disclaims positive knowledge of all else. This cannot be construed to be materialism, in the sense in which that term is offensive to religious minds; yet it is not surprising that the enunciation in rapid succession, of new qualities and changes inherent in matter, seems, in our time, to pious minds, to exclude the Creator from his creation, and to limit the boundaries of the continued directive influence of a personal God. It is not the place here to discuss the question, whether this anxiety is well-founded or not; but it is in the interest of art to question, whether the course pursued in the so-called defence of religion by certain modern militant churchmen, which attempts a scientific refutation of an imagined scientific attack contains, within itself, the promise of success. The old argument, that everything that *is* has a cause, and that, hence, there must be a first cause, and, that this first cause is God, is clad in scientific terms, and repursued with all the surroundings of a new geological inquiry. If we should find, they tell us, for instance, in some strata, a series of metallic globules which, by their uniformity, preclude the theory of their being a natural product, we should conclude these globules to

have been made by human hands, we should take them to be the result of an intelligent premeditation, to be shot, in fact; and we should insist upon it, that the presence of this shot in a deposit of nature indicates the presence of man: a directing intelligence; hence the law and order of creation indicate, with equal force, the existence of a creator of all things. Unfortunately for this argument and its conclusion, it partakes of all the weakness of human answers to human questions, and has very little of their strength. It is the mere echo of a question not carefully formulated.

Is there a first cause? This is the question. Everything has a cause is the argument; and hence all things must have a cause, is the conclusion. Preceding phenomena are here rashly accepted as a cause. But cause and effect, wherever we find them in nature, are but two links of a chain, the succeeding and preceding links of which are, in most cases, well known, and have in many been traced to a connection between the two ends of this chain. It is, in fact, an endless chain of no very great length; and where at times its continuity becomes obscure, there is yet good reason to believe that such a continuity exists. Hence we really know nothing of ultimate cause, and cannot make such a knowledge the basis of an argument.

Man may change the form, motion, and relation of matter within the limits of natural laws. These changes and relations are always temporary and imperfect. Man cannot create matter, nor can he endow it with motion. Creation, as attributed to the Deity, refers to the very existence of matter, and the perpetual laws of its motion. No sound conclusions can be drawn from the one to the other. The knowledge of

the universe, as attainable by man from his limited standpoint in nature, is insufficient to permit anything more than a conception that his own understanding of what is, must be but an insignificant part of an incomprehensible system and purpose, the nature of which cannot be approached by the contemplation of probabilities contained in the infinite series of possibilities which surround the subject.

When we consider the difficulties which beset perception of known material magnitudes whenever they exceed insignificant limits, such, for instance, as a million of miles or a million of diameters of the earth's orbit, or the ratio of the two, it must be apparent that no conclusion whatever, that is worthy of that name, can be drawn from human intelligence, which may be accepted as the foreshadowing of the divine intelligence. The belief in the existence of God is the intellectual equivalent of a knowledge that the mental capacity of man is limited. That the sum of knowledge, which forms the basis and purpose of law, represents the essence of power, is a logical conclusion warranted by the known limitations of human knowledge. Thus far and no farther reason permits us to pursue the subject. Beyond this we enter a field of conjecture, approximation and elimination of error.

Theology distinguishes three possible theories of the nature of the supreme intelligence—Theism, atheism, and pantheism; whereof the first determines this supreme intelligence to be the Creator of the universe, and to exist outside of and distinct from it; the second that it is the universe itself, which has always existed; and the third that it is an intelligent substance, not a personality, co-existent and developing with the uni-

verse, and becoming conscious in intelligent beings. It is impossible to apprehend how conditions of time, space, and matter can be correlated with the supreme intelligence, which is necessarily attempted in either of these three theories. It follows, therefore, that these schemes must be ranged with systems of faith which prescribe definitions of God in accord with that human comprehension which has its being, education, and development solely in the contemplation of matter and its properties, and in the relations of time and space. That these religious definitions are a human necessity may be inferred from the condition of the human mind which demands the identification of a principle with a personality before it can accept a relation with it, and farther from the fact that such definitions have existed always and everywhere. Jove, the god of the Greeks, was primarily the thunderer. Vulcan forged his bolts. This attribute of physical power was at one time sufficient to establish Jupiter as the King of Olympus. The Jehovah of the Jews is defined as the God who visits the sins of the fathers upon the children. Christianity teaches a God of love who exacts faith and obedience as the condition of eternal happiness. Modern science, as far as it has intimated an opinion on this subject, tends to the belief that God is law.

Who can say that either of these definitions, from the most primitive to the latest, is untrue? And then, again, who will be bold enough to assert that either of them exhausts the idea of the Supreme Being? A moment's consideration will show that all are based upon the theory that the final purpose of existence is confined to the well-being of man, the inhabitant of

this little planet; for although a God of law as foreshadowed by modern philosophy takes cognizance of all things, and comprehends within himself the direction of the whole universe, which includes its most insignificant part, yet how insufficient must be the thought of an eternal and unerring law unless combined with it we can comprehend, or at least suggest, a comprehensive scheme of the purpose of this law. On the other hand, if we are content to know of God only so much as concerns our relation with him, there can be no doubt that Jove the thunderer was as perfect a god for the primitive Greek as the God of love is for the modern Christian, and the God of law for the philosopher of the nineteenth century. But whatever our conception of God, our relation to Him, and our relation to each other and to all things in obedience to fundamental law, our definition of all these relations must be material and approximative, not absolute, not positive. We must leave philosophy behind us, and enter upon the realms of art.

Art is knowledge, the knowledge of material relations which may be made to picture all ideas which present themselves to the human mind as possible or probable relations. The sceptic imagines he may consign all these pictures to oblivion by the simple question, "Are these works of art pictures of true relations?" If they are not pictures of true relations, he asserts that then they are false, and must be condemned. All things which are proven to be true, must surely be accepted as true; but it does not follow that all things not proven to be true can for that reason alone be pronounced to be false. Art often conveys knowledge which has not passed the ordeal of logical demonstra-

tion; but it is knowledge all the same to this extent, that it may be true beyond a certain limit, up to which it has been proven to be false. If art persists in transcending that limit, it is justly assailable; but within that limit it performs a function for which no substitute can be found. And more than this, an idea depicted by art, which is recognized to be false in fact, still continues to possess a moral and cultivating influence, by reason of the piety of the thought contained in it.

The errors of those who theorize upon art are the assumption that such of her illustrations of ideas as have once been accepted as true must continue to be so accepted always, in spite of valid demonstrations to the contrary, and the assumption that art is a source of pleasure mainly, and only incidentally a source of knowledge.

We cannot imagine mental degradation so low, nor mental cultivation so high, as to reject knowledge, when it can be acquired without labor, or because it can be so acquired. Men may, by training, attain to a distaste for all mental productions which do not, in the most direct and concise manner, demonstrate positive facts; yet these very men love poetry, the drama, painting, sculpture, and architecture, for the truth they reveal of nature, in a scheme which is admitted to be fictitious, often. The most erudite will peruse the pictures and illustrations of a book, for the information condensed in picture language, before he proceeds to read it; and more historic facts have been gleaned from the epics, the statues and the architecture of the past, than from the state papers and inscriptions contemporary with them.

Whatever perfection the progress of science may

attain hereafter, human relations to the universe can and will be taught by art only. Jurisprudence can at best be but a compromise of human interests, while abstract virtue is inculcated by the efforts of art alone. Religion paints pictures of God and of our relations to Him, in words, in music, sculpture, painting and architecture: and there is no good reason to doubt the biblical statement that David also danced before the Ark. The state commands the devotion, the patriotism, the service of the citizen, by a poetical appeal to his affections, more than by the ties of material interests. Love and filial affection, friendship, gratitude, benevolence, and charity are fostered mainly by art. All these virtues have been pictured in poem, song, and painting, and are known and appreciated from these sources above all others.

When we speak of works of art, we are apt to refer to painting and sculpture alone; we think lightly of the ideas conveyed by these, and undervalue the knowledge of art accordingly. This is owing to the fact that paintings and sculptures are rare, and not readily accessible; also, that an advanced mental cultivation is needed to understand their full value. But when we consider the mighty influence of literature, music, and architecture, an influence which surrounds man continually, and which implants in his heart by constant attrition, as it were, sentiments of morality and virtue, the import of which his brain could never comprehend; when we consider that with the millions who read, and see, and hear art, and learn from it lessons of wisdom and goodness, with no other motive than to amuse themselves, to enjoy the success of human re-creation of nature; a mental and technical

feat, a picture, a story of a fictitious reality, or of a reality of the past reproduced; when we consider the impotence of the cumbrous machinery of human laws, the inefficacy of punishment and reward, and of the reasoning of philosophy, as compared with the humanizing influence of art, we must come to the conclusion, that as far as the mass of mankind is concerned, art is the sole source of ethic cultivation; that it is a necessity for the maintenance of society—a school which supplies the knowledge man needs in order to live.

It is true that we do not seek art for the knowledge it imparts, but for the pleasurable emotion excited by the contemplation of it; and it is imagined by superficial observers, that this pleasurable emotion is the sole outcome of art. The conditions of this pleasurable emotion are, however, first that an idea shall be expressed in matter; and, next, that it shall be well expressed. Unless an idea is expressed, there is no pleasurable emotion.

The successful expression of an idea in matter determines the beauty of a work of art; but in order to understand how beauty is the cause of pleasurable emotion, it is not sufficient to consider the nature of beauty alone, but also its cause in art. The nature of beauty is to be found in the successful expression of an idea in matter. The idea itself may be the reverse of beautiful, or true, or moral. The objects selected for the purpose of representing the idea may be ugly; yet the result of all this is beauty, if the idea is successfully represented. Objective beauty consists in the capacity of an organism to perform a function, and in the clear expression of this capacity in its form; and beauty in art in the rendering of this form in

matter for the purpose of expressing the function, the function being the expression of an idea either directly or indirectly, by betraying an emotion which has found a material expression in a physical modification of the organism. It must be clear that the subjective perception of a work of art deals simultaneously with its beauty, that is, the objective functional expression of an idea, and the art force which has successfully represented this idea in matter. This art force, which consists in the mental and technical skill of the artist, and is the cause of objective beauty in art, is also the cause of the pleasurable emotion, and is perceived by the subject simultaneously with the beauty of a work of nature or fine art. But, inasmuch as the beauty of a work of art is not lessened by the ugliness of the organism represented, provided always this ugliness is premeditated, it follows that the term beauty, when applied to a work of fine art, refers to the magnitude of art force displayed only as perceived in the result, and that there is a difference between it and abstract beauty as found in nature. But a moment's consideration of the subject will show that the two are identical in this sense, that both pertain to organisms which in their form express function as intended by the force creating them. When the artist in his re-creation of nature intends to represent a thing or an organism which is ugly, that is, which does not by its form betray the due performance of functions, then this intention, contemplating a peculiar organism of negative functional qualities, constitutes the creation of a standard of function upon which the art work is to be based and the successful representation in matter of organisms which respond to this intention, betray art force,

and hence result in beauty. For instance, let the idea to be represented be charity. Gossip is a negative act, which may be selected to illustrate charity. The painter may depict gossip by a group of ugly, ragged persons sitting by the roadside, or standing around the gateway of a barnyard discussing their neighbors. Here we have ugly subjects, ugly surroundings, an immoral practice. Yet if the artist succeeds in expressing in his group the ill-feeling, jealousy, and malice of gossip, he has produced a work of beauty, simply because his group performs the functions he intended to express, and in spite of the fact that the individuals composing it perform the functions of life very badly. It is even so in nature. We may discover beauties in deformities of her creation if we analyze them, simply because of abnormal functions detected, which are well performed, and are equally well expressed in their form.

The simple definition of fine art, that it is, "the representation of an idea in matter," contains a sufficient explanation of the nature, function, and scope of it.

First, that it deals with ideas (relations of matter), and represents these ideas in the form in which they are found in nature, or in forms which are the result of natural laws. It does not demonstrate or define these ideas, but represents material forms in action or in passive submission to action, which illustrate these ideas, and which compel emotion. This emotion is depicted by art as a physical modification of matter.

To conceive a work of fine art, the idea to be depicted must first be materialized. The question must be answered: how is some organism affected by this

idea? and how is the physical form of this organism modified? This organism so modified must then be represented in matter. This means that we are not to speak of the idea; we are not to define or to demonstrate it: but we are to paint a picture of the modified condition of an organism affected by it. If this picture is painted on canvas or cut in stone, we need but to copy the modified organism as it presents itself to our senses. If we describe it in words, it must again be a painting, a sketch of physical form and of a material expression. If the organism be a person who speaks, we must introduce him not as a lecturer upon the subject of his emotions under the influence of this idea, but as pursuing the tenor of his life, and betraying in his conversation the nature of this emotion. We must describe him as he looks, and quote him as he talks, and through his looks or his talk must shine the emotions to which he is subjected.

If music is the medium we select for the representation of an idea, we must utter the sounds representing the emotions which this idea would cause in certain persons under certain assumed conditions.

If architecture is to express an idea in a structure, the relation of this structure to human groups must be expressed in its form, and the emotions of these groups must be impressed upon it by modelling, decoration, and color.

An idea may be *demonstrated* in matter. In that case it is not necessary to enter upon acts or emotions, nor is it necessary that this idea should first be materialized, or in any way attached to or connected with matter. We may here deal with quantities disconnected from the nature of their entities; we may

figure these quantities as lines or surfaces, or as mere distances of points. We may deal with organisms without reference to their form. In all cases demonstrations of this kind are of a scientific nature, and are to be distinguished from a representation of an idea in art mainly herein, that they analyze the conditions, while art depicts the ultimate results of relations of matter. These ultimate results in that case are copies of similar results heretofore actually observed.

On the other hand, the line may be drawn distinctly between fine art and mechanic art. Mechanic art includes all human productions which do not contemplate the expression of an idea, of objects not found in nature but which are needed for use. Mechanic art contemplates form, but only the form which responds to use: hence the common definition that works of mechanic art are those which are necessary to man, and works of fine art are those which are unnecessary. It seems but a waste of words to dwell upon the fallacy of the latter definition.

The nature of the ideas which may be represented in art is, in one sense, limited only by the ideas which can be demonstrated by science. Art of necessity occupies itself with all possible ideas which have not been demonstrated. It depicts them in the condition of progress in which they are found. A sheet hung upon a pole may answer as a ghost; a human figure floating in a surrounding of fleecy clouds is a better one. The existence of ghosts may be doubted in the nineteenth century without censure; yet this has not always been so: and there are millions of persons existing now, to whose moral welfare ghosts are a necessity of which they should not and cannot be deprived.

Besides, the ghost is the pious substitute of unknown force, which does not fail of its salutary artistic effect upon the most cultivated audience.

It may be remarked here that humanity, up to this time, at least, has found it necessary to entertain undeveloped, incomplete, and improbable ideas. Not even science is exempt from this necessity. These ideas are the stepping stones to progress. The planetary system of Tycho Brahe, the vortices of Descartes, and Newton's corpuscular theory of light, may be cited as instances of the kind. "The luminiferous æther," says Young, "pervades all space, and penetrates almost all substances; it is highly elastic and absolutely solid." Herschel estimates its pressure at seventeen billions of pounds a square inch. This æther may be described as an art picture of an unexplained condition of matter, by reason of which light consumes time in acting through space; a process which remains incomprehensible without the presence of intermediate matter, and therefore the existence of the æther is to-day accepted by scientific men. Science has discarded similar theories with tardiness, because they perform a necessary function in serving as a nucleus around which valuable scientific facts can be conveniently ranged, which would otherwise become almost valueless by reason of their isolation. Scientific men profess a readiness to discard every theory of this kind the moment it is disproved. Art should follow this example by elaborating ideas in their progress, instead of tenaciously holding to them after they have been virtually discarded. That this is not done promptly, however, is capable of an explanation, not discreditable to the understanding of artists and lovers of art, viz.: The value of a work of

art is less dependent upon the approximation to truth of the idea which it depicts, than upon the skill with which the idea is depicted.

Science investigates matter and its motions for the mere sake of knowledge, and without direct reference to human interests; but art is confined to ideas pertaining to actual or imagined human interests and relations. Hence the audience of art includes all mankind; that of science is limited. Those who learn scientifically are especially prepared to make themselves receptive; those who derive their knowledge from art are mainly unconscious of the process and uncertain of the position they occupy in relation to their teacher. Like a sponge they absorb, and with no other intent than to enjoy the pleasurable emotion produced by the process. The knowledge acquired from art is always seemingly full and complete to the subject; no doubt remains to be solved, no question to be asked. This begets confidence of judgment; the conviction of the master rather than that of the student. This condition of the popular mind with reference to art, is not without a reacting influence upon art and its productions. The law of demand and supply asserts itself, and art is forced to create what gives universal pleasure, and not what conveys the most needed ideas.

Mechanic art as well as fine art is engaged in developing expressive forms of physical functions, with this difference: that the physical functions expressed in fine art are the result of emotions, and hence derived from an idea, while the functions expressed in the forms of mechanic art relate simply to physical needs. This difference is not clearly understood, and

the line between the two is not sharply drawn. There is a certain beauty to be found in mechanic art, which is the art force manifested in expressing a physical function. From the complicated weaving or knitting machine down to an axe-handle, all tools, more or less, express their function. This expression is the result of a study of the nature of that function, and of the knowledge of the natural laws which enable the mechanic to respond to them, and of the technical skill required to model the resulting forms.

Furniture, clothing, porcelain, gold and silver ware fall into this category. They are valued commercially because they are fitted for their purpose, but more especially because they express that purpose. They are not created to express ideas, but to supply human needs; but they may or may not express their function well, and are valuable, therefore, in the ratio in which they do, and their beauty and ugliness is spoken of as an important element of value. It follows, therefore, that mechanics and artisans realize the fact that they must create objects of beauty, in order to find a ready sale for them. Two men of equal mechanical skill and theoretical knowledge may set out to make a chair. Let us assume that one of them has never heard of the word beauty. He attempts nothing of the kind, but contents himself with making a good, serviceable chair, a chair well fitted to sit in. Of course he will not succeed in making such a chair at once; but, after building ten, twenty, or a hundred chairs, he will probably produce one which will not only be of durable construction and pleasant to sit in, but every part of which will express its mechanical function and the mechanical capacities of the material em-

ployed. The other, in his search after beauty, will be governed by his understanding of the nature of beauty. If his definition of beauty is the correct one, he will do precisely what the first mechanic has done, and succeed as he did. But if he imagines that beauty is the property of certain forms or lines, or decorations, or coloring, he will attempt to introduce these forms into his chair; and whenever he finds that his construction and material are inconsistent with these forms, he will suppress or cover up the construction to make his beautiful form possible. The result, of course, will not be permanently satisfactory, and a change for the better will seem to him desirable. Effort will succeed effort in this manner without good results, and, finding that his chairs have a sale while new or strange in form, he will change their form as often as possible, without any other aim than that of change. Every season will bring forth a new chair, but not a better one; and his chairs will be as bad at the end of twenty years as they were at the beginning. Yet this man will talk much of beauty at the beginning of his enterprise, and of beauty and fashion toward the end of it; and, if financially successful in his dealings, will serve as an authority on both these subjects. The chairs of the first man also will have a ready sale, provided he does not make too many of them; but their merit as objects of beauty will not be fully recognized until he dies and can make no more; and will not be popularly established until chairs of his make are to be found only in isolated collections of rare furniture.

Now, works of mechanic art, although not intended to represent ideas in matter, nevertheless convey ideas of material relations to which they are formed

to respond. A chair, by frequent use, becomes familiar to us as an object capable of supporting a person. Our conceptions of mechanical stability are, in the absence of scientific training, formed by constant practical experiments in using the various works of mechanic art with which we are surrounded. When a man sits down upon a chair, he is practically testing its strength; and if he has used it for a time he is justified in concluding that it is sufficiently strong to carry its habitual load. In this manner men come to regard articles of furniture as expressive of a certain mechanical function, and articles of clothing as expressive of certain natural forms. The bulging escritoires, sofas, tables, bedsteads and chairs of the last century mounted upon attenuated curved legs, were imagined to be beautiful specimens of furniture: and the cocked hats, peruques, queues, coats, and bosom-frills of the same time, just expressions of the human form.

The works of human art, if not wisely conceived, not only fail to convey true knowledge, but are the source of error and prejudice. The human mind becomes warped when surrounded with artificial forms of defective organism. During certain periods of so-called civilization, the very ideas which determine works of human art are entirely lost sight of, and art forms are referred only to the caprice of their author, and to no tangible law, principle, or idea. Now mechanic art forms a very important element in this sort of knowledge, for it teaches the rudiments of it—that elementary knowledge which may be easily traced to human needs, and which involves no complicated or remote ideas. If we build wardrobes with castellated tops, the saloons of steamers in wooden imitations of columns,

arches, and entablatures; if we endow book-cases with roofs, and make carpets an aggregation of natural flowers, or houses and landscapes, we do violence to the artificial organisms we create, and pervert the minds of those who are surrounded by these works of art. They soon cease to look for reasons which determine forms, but accept them as conventional truths, and become thereby insensible to rational form. Around a very small nucleus of real art, society cultivates a vast array of spurious and false art, and so overwhelming is its influence upon the human mind, that art is but exceptionally recognized as the logical sequence of reason, and is popularly accepted to be the result of a personal inspiration, or, as it is usually called, of art feeling. Not only the layman, but the art student participates in this popular error.

Until the philosophy and the technique of the arts are taught in a scientific manner, both mechanic and fine art must drag on an empirical existence, pregnant with all the harm to society which has brought it into disrepute as a source of knowledge.

Natural organisms also serve the purpose of teaching the relation of form to function, but the majority of men are by the processes of so-called civilization removed from nature, and surrounded by the creations of art. While one work of art teaches truths, a thousand teach falsehood. Many schools have been established for instruction in the mechanic and industrial arts. The models placed before the pupil in these industrial schools are again representations of the fashionable forms which find a ready sale in the popular market. No earnest attempt is made to purify art of its errors, or to teach true art, because it is deemed

more pressing to train the pupil to do what is currently sold.

The great popular art staples, the works of mechanic art, and of literature, the popular stage, and architecture are degraded to the lowest ebb. Complaints that English manufacturing interests are deteriorating the high standard heretofore maintained in the treatment of color and texture in Asiatic woven fabrics, it may be feared, are not without foundation in fact. A slow but certain mental revolution is in progress which divides society intellectually into two classes. The one comprises a small minority of learning and progress; and the other, forming the mass of mankind, is accumulating prejudice and error, and sinking into barbarism. Science not only cannot reach this great mass, but affects it injuriously by fostering the conceit of a little learning. The false philosophy of the past, which was the outcome of the limited mental capacity of social and religious leaders, is weakened no doubt in popular influence, but only to make room for a prolific crop of similar errors, which grow spontaneously in the mind of the individual who believes that, as a citizen of a highly civilized community, his right to original thought cannot be disputed. But by original thought nothing better is meant than the hasty impressions accompanying imperfect sensuous perception, mere sentiment, mere emotion, mere feeling.

Absorbed in the acquisition of material wealth, the citizen of the nineteenth century overlooks the vast amount of human labor squandered upon industries which have no intrinsic value, and which are consigned to waste as soon as a change of fashion has introduced new forms equally valueless. It is believed that so

called luxuries should be encouraged, in order to give employment to labor. This would be true, if the result of this labor had a real value as an object of luxury. But, as it has no such value in fact, the inquiry whether human labor squandered can be beneficial to society becomes a serious question. It so happens that human wealth has no being outside of the outcome of science and art. Agricultural lands, railroads, ships, manufactures, mines, tenements, are not wealth: they are only the means, the tools to sustain life. Wealth is what remains after life has been sustained by food, clothing, and shelter, and after the means have been supplied for further similar supplies.

The British Museum, Westminster Abbey, the Houses of Parliament, the Cathedral of Cologne, the collections at the Louvre and the Vatican,—all these are human wealth. How much of this sort of real wealth is being produced by the gigantic efforts of modern mechanical and other scientific improvements, or by modern human labor?

It is true that the invention of labor-saving machinery has increased and somewhat improved the physical supplies of the masses. We have more and better food and clothing, perhaps better and cleanlier dwellings. The streets of cities are properly sewered, and partially lighted at night. Life and property are less insecure than they have been heretofore. These are great gains, not to be overlooked or underestimated; yet it must be admitted that our boasted progress in science has done but little for the mental culture of the masses. This is not to be laid to any shortcoming or defect of science, but simply to the fact that the masses cannot be mentally benefited by scientific pro-

gress. This progress must and will continue to accrue mentally only to the few who can devote themselves to the study of science. The masses may be benefited materially by the indirect results of science; mentally they can be taught only by art. What should be done to enhance the efficacy of art teaching? All that is necessary is that works of mechanic and fine art should be made true works of art. Now what are the means to that end?

As in all human progress, we must begin by the elimination of error.

The chief of these errors is the popular belief that the pleasurable emotion, caused by the contemplation of art, is of itself a test of art; although many objects not works of art produce a similar emotion. Things new and strange, huge or minute; things costly or elaborate; yes, even things devoid of any traceable quality whatever, if used or possessed by persons of fashion, or by large numbers of people, are desired by many, and their acquisition is accompanied by the pleasurable emotion; yet they are not only worthless, but tend to stunt the human intellect. Their very existence is a reproach, the sight of them a mental injury.

As there is no short cut to the knowledge of art, and as the mass of the people cannot be expected to study art, so as to know it when they see it, and avoid its counterfeits, we can only advise the layman to beware of things whose only merit is, that they are in the fashion, and to proceed in the purchase of works of mechanic and fine art, as he would in the purchase of anything of which he is ignorant; that is, to employ professional advice.

The next error to be eliminated is, that the emotions help to create art. Art appeals to the emotions, but it is not produced by emotions, feelings, sentiment, mannerism, or, as Carlyle has it, by modern dilettanteism of any kind; but by the cunning, the craft, the skill of art. It is the result only of sober, cool, intelligent thought, and of technical knowledge, which is acquired only by hard, persevering, and long continued labor. Above all things, the student of art should remember that premeditation is its first characteristic; that to produce art work the artist must have a clear and definite understanding of the idea to be celebrated in art, and a thorough knowledge of the technical methods requisite to represent this idea in matter. Let it be well understood that we cannot paint a picture and then consider what we shall call this picture, painted as it were by accident, and yet claim for it the title of a work of fine art. It is true that anything well painted, or cut in stone, or expressed in words in imitation of nature, is a respectable study of art; it is a sort of work students of fine art must do in order to attain to ultimate perfection. But to create a work of fine art, it is necessary that an idea should be represented in matter with premeditation, and that the artist shall, from the beginning of the work, and throughout every stage of it, be the master of the means and methods of accomplishing this object.

The next error is the supposition that artists are born, not made. Genius, natural genius, it is imagined, constitutes their sole art force. This is true to this extent, that no one can succeed in any vocation of life without natural abilities of a certain kind and

degree. A healthy physical development, more especially of the brain and nervous system, is a condition precedent to the acquisition, retention, and application of knowledge of any kind. But knowledge of the combined experience of past geniuses is a primary necessity to progress in art, as well as in any other branch of human learning or technical dexterity. To acquire this knowledge, natural aptness and love for the subject are a great help, no doubt; and without a certain degree of this natural capability no success is to be expected. Yet we cannot even assert that defective sensuous perception is absolutely a bar to perfection in art, where one is bent upon overcoming obstacles by application and industry. Men with defective sight, speech, hearing, and muscular development, have become painters, sculptors, and orators. If we contemplate the great works of human art, we will find that all successful artists have pursued art with unremitting labor and study, and whenever in art we observe the power of genius, close scrutiny will also show profound study and knowledge. Genius never can supply the artist with knowledge nor with technical ability, it only helps him to make the best use of both. If Shakespeare had been born and bred alone upon a desert island, no amount of genius could have enabled him to write his Macbeth, Richard III., or Othello. The plots of his plays are mainly carefully selected acts, illustrating comprehensive and exalted ideas. The acts are taken from history, and are of the highest order as ideals for poetic treatment. The knowledge of the emotions produced by these acts is, surely, not invented but acquired; and the language in which these emotions are depicted is often the language of

persons far removed from the probable language of the associates of the poet.

The popular judgment of inherent genius in art is deceived by the ease, grace, and naturalness of all art work. It seems to flow from inspiration, when in fact it is the result of great labor. The hard work, practice, and study required to prepare the artist for his work, far exceed that of any other vocation of life, and, so far from being the agreeable work which it is popularly imagined to be, it is in its elementary stages, and for a long period of time, the most discouraging and wearing labor man can undertake. Scientific inquiry or study leads from step to step to new revelations of truths which are in themselves acquisitions, and can be held and possessed as completed elements of further progress. In art every advance is merely an approach to, never an attainment of absolute success. The true artist is doomed to remain a student throughout a laborious life. It is only the dilettante who is happy in his shadow of knowing.

It is the great merit of art, and its main function, that it may confer knowledge upon uncultivated minds. This, however, is not the knowledge contained in a work of art, but merely that modicum of it which the subject is able to comprehend. To the subject this fragmentary knowledge seems complete. State to a person not familiar with geometry the simple fact that a line drawn from the apex of the right angle of a right-angled triangle, perpendicular to the hypothenuse, represents in its length the geometrical mean of the two fragments of the hypothenuse which it divides, and his mind will be a perfect blank as to the nature of the information imparted to him. You may explain the meaning of

the terms used, and you may even illustrate your statement by a diagram. As long as your auditor is not in full possession of the whole argument involved, he can know nothing of the fact related.

A picture, a poem, a statue, a structure, no matter what the idea they represent, produce a mental impression upon every person. And what is more: this mental impression contains within itself an embryo, as it were, a sort of glimmering of the idea intended to be conveyed by these works of art.

This is the reason why art teaches every one, even the most uncultivated; and it is unfortunately the reason, also, why every one thinks that he can understand art.

The very first thing to be done, therefore, is to impress men with this very fact, that they may be taught by art as well as by nature; but that they may not presume for this reason alone to judge works of art any more than they dare to criticise the works of nature. Mere sensuous perception is sufficient to apprehend the knowledge imparted by art; but a knowledge of art is needed to understand its merits: and this knowledge is to be acquired only by long-continued, arduous study. The common error that genius alone enables artists to do art work, should be eradicated. By this error men imagine, because they are favorably impressed by a work of art, that they, too, are possessed of genius; and that their genius also may break out in art work presently, perhaps greater in merit than anything produced heretofore. Let us imagine, for a moment, a similar state of things in science, in the law, in mechanics, or in agriculture: let us imagine men rushing to proclaim, teach, and illus-

trate by practical effort the crude offspring of an ill-regulated fancy, under the impression that they are enriching the world with knowledge, and that there is no one to stem this torrent of error. Would not society sink into barbarism under such a system? If a book were printed to-day which taught that the earth is flat, and rests on the back of a turtle, it would meet with no attention in any respectable quarter; and no one would accept such a theory as truth. Such a book would certainly find no sale in the market. The reason why we disregard the theory now, is that it has been long ago superseded by Newton's law of gravitation. But suppose that some notable personages or associations of persons should accept this theory, not as incontrovertible, but as a debatable idea which, at least for the time being, is to them interesting, and an idea rather to be admired than otherwise; suppose that, to be in the fashion, it should become necessary to affect the turtle theory, to adduce reasons in its behalf; suppose that men of science who hold it in contempt should shrink from expressing their opinion on the subject for fear of offending their neighbors who happen to be infatuated with this error; suppose, farther, that the temporary success of such a publication should encourage unscrupulous persons to invent similar fallacies, which by sheer force of impudence and novelty should supersede each other in regular rotation, and find a sufficient audience, to make them of authority,—what would become of science and truth in the meantime? Now this is exactly the condition in which the whole civilized world is placed at the present time by bad, perverted, and defective art. No one whose opinion is of value asserts that this bad art is good art;

or that its existence is not deteriorating popular morals and the popular intellect. But, on the whole, society has taken it under its patronage, and it thrives by social protection.

If modern dress, furniture, structures, literature, and decorations, were the best results of the age; if they had at no time previously been excelled; if, in fine, we knew no better, this would be a sufficient reason for accepting their crudeness, ugliness, and inconsistency. Even if we had known better art heretofore, and could not now approach former excellence because the ablest minds of the present era are not capable of it, we should be warranted in tolerating it as it is. But surely we know that our costume is hideous, and that by far the largest portion of our architecture is undeserving that name; that the bulk of literature is bad, and popular plays, if not demoralizing, are certainly vapid, aimless, and without point. We know that so-called popular music and dancing is, to say the least of it, indifferent in quality; and that bad painting and sculpture, furniture, hangings, and house decoration, aimless gardening, and bad mechanic art find abundant acceptance in our markets. Why is it that men of brains, of learning, of piety, and of high social position silently submit to this state of things? Why is the direction and management of this matter left to fops, dandies, tailors, and quacks of all kinds, instead of being deputed to men conversant with art? It is because in science, trade, statesmanship, agriculture, theology and the law, society meekly submits to the authority of those who have distinguished themselves by superior attainment in these branches of human knowledge; while all the world besides pretends to a

knowledge of art and forms that terrible majority which compels bishops, princes, and learned professors, to appear in pantaloons and swallow-tail coats in polite society. The poor benighted Zulu, who eagerly adopts the European costume, is a reproach to us in this very matter; he finds the white man to be his superior in war and in the arts of peace, and he accepts his garb because he respects the man who wears it. What reason have we to submit to the tyranny of fashion? Do we respect the men who invent it? Do we admire it in any sense? Do we not detest and abhor it? There is no trace to be found in nature which points to the incongruous and absurd forms of modern art. They are pure inventions of an untutored, illogical, and disordered brain.

Prof. Tyndall, in the "Fragments of Science," (fifth edition, page 90) asks the question: "Is it necessary that the student of science should have his labors tested by their possible practical application? What is the practical use of Homer's Iliad? You probably think that Homer's Iliad is good as a means of culture. The people who demand of science practical uses forget, or do not know that it also is great as a means of culture—that the knowledge of this wonderful universe is a thing profitable in itself, and requires no practical application to justify its pursuit. The student of nature distinctly refuses to have his labors judged by their practical issues, unless the term practical be made to include mental as well as material good."

What a world of thought is contained in these few words: thought which applies to art in its most important significance.

We may learn from this simple, clear, and logical

sentence, that "the knowledge of this wonderful universe is a profitable thing of itself," and that the knowledge of art is equal to it in their joint function of human culture; that mental culture is a practical boon in no way inferior to any material good. And much more than this may be read between the lines. Science teaches man to think logically; and art acquaints him with true human thoughts. Thought he needs to attain the material good which secures existence as an organism; but, more than this, he needs it to attain the mental good which endows him with the dignity of a man.

It has been often stated, and is doubtless true, that to think correctly man needs a mathematical training; for this solves many problems and points with force to the problems which as yet cannot be solved. To the untutored mind, the solution of no problem seems impossible, nor can the untutored mind solve any problem. There is no such thing as bad science, for bad science is not science at all; hence, the man of science knows fully and perfectly either that he does or does not know.

Unfortunately there is such a thing as bad art—art that is false, not true; and this bad art teaches with the same facility as true art, with this difference, that it teaches falsehood. It pretends to re-create nature, but it creates only misconceptions of nature, things adverse to nature; and its teaching perverts men's minds, and dements them.

Another peculiarity of art teaching is, that art presents to us ideas in the emotions they produce; and we sympathize with these emotions, and make them more or less our own. We feel, as it were, the force

of the idea without clearly understanding or realizing its nature. If the ideas conveyed by the art which surrounds us are true ideas, we are filled, as it were, with sound convictions; and if it is bad art, we are filled with unsound convictions. But, in either case, we have not been prepared to reason on the subject; and the evil results of bad art cannot be removed by the ordinary processes of proving a fallacy, for no matter how lucid and direct our argument, it addresses itself only to the reason, and not to the feeling of the subject. Hence it is that the mental injury done by bad art can be repaired (with the masses who receive education from art) only by its removal from sight and hearing, and the substitution of good art in its place. The heresy of the present age is in the belief that bad art does no special harm, and that good art does no special good beyond the pleasure it affords. It is imagined that the pleasure produced by art answers as a substitute for other less desirable pleasures, which would be cultivated and sought after in the absence of art. The knowledge conveyed by art is almost entirely overlooked; and to make this knowledge potent, to secure its cultivating influence to humanity, its existence must be brought out in the clearest light.

PART III.

NATURE OF ARCHITECTURE.

CHAPTER XVI.

DEFINITION OF ARCHITECTURE.

If a structure is erected to accommodate a number of persons who congregate in it, not for the purpose of gratifying physical needs only, but in obedience to an idea, such a structure is called a monument of this idea.

Inasmuch as man always needs protection from the weather, and space to be in, whether he is intent upon the mere gratification of these physical wants, or upon the intellectual contemplation of ideas pertaining to human relations, it is evident that architectural monuments also indirectly deal with physical human wants. On the other hand, there are many structures which are built mainly to answer physical human needs, but which, at the same time, are intended to express ideas, such as dwellings, structures devoted to business pursuits, or charitable purposes, and many others. It appears, therefore, that in almost every structure erected for human occupation, it becomes the problem also to express in that structure an idea.

Architecture is the fine art by which ideas are expressed in a structure, and more especially in a monument.

How is an idea to be expressed in a structure? Its form must of necessity be purely ideal. There is

no object in nature which can be accepted by the architect as a model for his creation. Yet imitation is an unavoidable element in a work of fine art. These are the complex questions which present themselves to the architect. We can arrive at a clear conception of architecture as a fine art only by answering them, and by showing the co-existence and the correlation of all the conditions.

We have seen in a preceding chapter how in sculpture, painting, poetry, and dancing, ideas are represented in matter by the depicting of motions of matter (the modifications of the muscles and of the figure of man), as affected by the emotions, the result of acts which illustrate an idea. How can this be done in a structure? Can it be said that a structure performs an act illustrative of an idea? And if so, can this act produce in a structure emotions? What are the skeleton, muscles, sinews, and nerves of a structure, which may be made to express emotions? And how, if all this is possible, can it be done in imitation of nature? or where in nature are we to find the model for our purpose?

It is well known that a structure performs an act in affording shelter to man to protect him from the weather. This act of affording shelter is performed in various ways by different kinds of structures. A community is supplied with dwellings, school-houses, churches, theatres, libraries, assembly-rooms, and courts —they all afford shelter to the same individuals in various combinations, but under different conditions. It is to the nature of these conditions that we must look for the idea expressed in the structure.

When men assemble for the worship of God, for

the administration of justice, for instruction and amusement derived from dramatic or musical performances, or for social intercourse, in the pursuit of pleasure which is of an intellectual nature, and contemplates directly or indirectly the artistic development of an idea, or in any pursuit whatever which tends to similar ends, they arrange themselves in groups best suited to their personal convenience or to the individual relations of the participants in the entertainment or other proceedings carried on in these respective structures.

If these groups are the simple result of physical personal convenience, then the structure fitted to accommodate these groups is merely a work of mechanic art. But if these groups are organized to express an appreciation of an idea illustrated by acts performed within the walls of a structure, either by word, motion, or sound (music); and if by their grouping they indicate an emotion, which is the result of the acts participated in, or merely perceived by the senses; and if the structure is so arranged as to express, or at least betray in its form, in the modelling of its masses and parts, in its decoration and coloring, an adaptation to and expression of the presence, order, magnitude, number, and relation of the groups accommodated in its interior—then this structure is a work of fine art expressive of an act illustrating an idea. For example, a room containing a counter for the sale of food to persons standing or sitting before it, or a bar for the sale of beverages, under a similar arrangement—the affording of shelter and accommodation for these persons—may be developed into a highly respectable work of mechanic art. It may be worked up into a struc-

ture which is a perfect body, a body which does physical work well and appropriately, but which has no soul, no thought to be related, unless it be the simple legend, "Men are fed here."

A meeting-house containing nothing but closely-packed sittings, wherein men and women are stowed with economy of space to listen to a discourse from a pulpit crowded against a wall, is not a work of fine art; for the position of the audience does not indicate an emotion, say the worship of God, which is the result of an act in illustration of an idea, say our dependence on God and his universe, of which we are but an insignificant part. Structures of this class, indeed, perform the act of sheltering men from inclemencies of the weather, but not an act which is the result of an idea. On the contrary, such a structure is merely the result of a physical necessity, for the meeting-house, like the bar-room, is constructed for the mere purpose of human stowage, without reference to any possible act of the audience beyond mere existence, and is strictly prohibitory in form and expression of any demonstration which is the result of an emotion. When the men who feed and drink, or those who listen to the discourse, make any motion, it must be to leave the place. The limits of the structure forbid any method of grouping other than that of a series of equal human quantities, which have but one desire, viz.: to be accommodated without being crowded, and to be protected from the sun and the rain.

But when, on the other hand, we see a structure providing for a combination of groupings various in magnitude, elegance, dignity, and richness, which combination in part or as a whole represents certain acts

of these groups, say prayer, praise, confession of sins, exhortation, the partaking of the communion, baptisms, marriages, funerals, ordinations, processions of various kinds, and consultations, such as we find embodied in the nave, aisle, choir, cloister, chapel, vestry-room, chapter-house, and baptistery of a cathedral, we may then say that such a structure denotes acts which are the result of ideas, and that it assists the congregation within it in the performance of acts explained by their resultant emotions.

Men may perform acts recognized as physical acts, such as eating, drinking, breathing, sleeping, etc., or they may perform acts which are equally recognized as spiritual, such as the expression of joy, devotion, hope, contentment, anger, rage, regret, etc. Both kinds of acts are modifications of the human frame, both are made manifest by physical demonstrations; yet we attribute the one class absolutely to physical needs, and the other to ideas, thoughts, and spiritual concerns. The one is a series of acts looking toward the supply of immediate and individual personal wants; the other is an inquiry by man made of his inner consciousness concerning his relations to God, to nature, to his fellow-men, and to himself, which suggests laws, precepts, and rules of conduct ordained to sustain cosmic life: and these result in a series of acts which demonstrate the ideas pertaining to these various relations.

Now if a structure is devoted to physical needs, it becomes the mechanical housing of a mechanical operation, and is, therefore, a work of mechanic art; but if the structure is devoted to spiritual acts, or to acts relating to moral principles, to the fundamental laws of human relationships, to the end that we may sustain

the life of humanity, protect and guard it, then it becomes an arena for these spiritual acts, and thus an integral part of a scheme by which is performed an act expressive of an idea. In the first instance we are concerned with the mechanical perfection of the structure only, which means that each part shall do the mechanical work imposed upon it, and insure the stability of the whole. The organic parts of a structure considered in this light form its skeleton bones and sinews; and in their creation no special note is taken of the ultimate expression of mass and form. It is not attempted to make visible to the observer that mechanical work is done well, done with ease, grace, or elegance; nor is it necessary that in a structure devoted to the supply of mere physical needs, the variety of functions performed by its occupants shall find expression in a corresponding variety in the form and relation of its cellular organization. Mere economy and mechanical certainty of ultimate performance are all that is demanded of the author of a work of mechanic art.

But where a structure becomes related to a human group or groups, or is a housing of the same, and these groups are in motion—motion determined by emotions (a process of reaction of the mind upon the body) in consequence of physical acts performed, which illustrate an idea—then this housing or structure, by its own grouping, must express the groups contained within it. In the length and breadth of its single cells, or groups of cells, it must indicate the purpose of each group, and the range and scope of action permitted to the persons forming it; and in the altitude of single cells, it must express the degree of dignity, absolute and re-

lative, attached to individual groups. Furthermore, the methods of construction must express the elegance, boldness, and dignity of the idea represented by the structure; while modelling and decoration must correspond with the character of the construction selected.

If in a structure these conditions are complied with, it may be said that the structure as a whole, and in its parts, betrays emotions the result of physical acts illustrative of an idea, and that it is a work of fine art.

That a work of fine art as herein described is necessarily ideal in its form, needs no special demonstration. Yet the idea that cathedrals are direct imitations of avenues of trees, and that capitals of columns and piers are modified flower baskets, has met with approval by some writers on architecture to such an extent as to make the young student a firm believer in it. Mr. Thomas Hope long ago disposed of this matter. We cannot do better than quote his view on the subject before we proceed to the consideration of imitation in architecture. He says: "Struck with the similarity which an avenue of trees presents to that boast and masterpiece of the pointed style, the nave and aisles of a vast cathedral of the fourteenth or fifteenth century, in their parallel rows of clustered and knotty pillars, whose lofty stalks ramify and spread out on all sides, whose ribs cross and interweave themselves with those arising from the other neighboring pillars into a series of pointed arches, showing the light through on every side, and terminating in luxuriant canopies imitative of foliage, flowers, and buds; admiring the resemblance to those majestic stems which arise at equal and measured distances, and whose branches meet and intertwine themselves with each other in dense vault-

ings of luxuriant foliage; and at the same time little acquainted with the various successive stages by which the last and most refined pointed style gradually succeeded to, and grew out of the prior and very different system that prevailed in Europe—the learned Warburton and others after him have derived its origin from the natural arbor formed by the stately trees of an ancient forest.

"Still further misled by the vulgar appellation of Gothic, given in England exclusively to this style, and by the northern birthplace which this denomination seems to assign to it; and recollecting that the earliest priests recorded in the North—the Druids—were said to have performed their sacred rites in forests, and to have made ancient oaks their temples and their sanctuaries—some have fancied that among the Gothic nations, when converted to Christianity, some lingering fondness for their heathen customs; some wish still to commemorate their pagan rites in their Christian worship; some desire to give their laboriously constructed churches the form of the natural temples of their ancestors, caused the adoption of the pointed style; and have thence traced every most high wrought detail of the architecture to the spontaneous developments of nature; and have regarded such wonderful productions as the Minster of York, the Cathedral of Rheims, and the Domes of Strasburg and of Milan as little more than mere fac-similes of those oak woods in which Druids burnt their human victims in osier baskets.

"A very recent author, without altogether adopting a derivation so very distant, has given to the pointed style an origin which bears a certain relation to it. He considers not the Gothic cathedral, with its fasci-

culated pillars, its intersecting ribs, its budding cusps and finials, as imitated from trees still rooted in the ground, still in a state of the most entire and expansive life and vegetation; but only regards it as copied from primitive constructions of posts, and branches, and twigs, cut from the parent roots, but again planted in the ground, and interwoven together, which, from the sap still remaining in them, or newly drawn from the surrounding elements, have again put forth some buds and leaves.

"If we wish to rest on a sufficient foundation any supposition which attributes to one peculiar modification its origin in another different from that which forms the subject of our conjecture, we must take care that the resemblance between what is supposed the offspring and what is called the parent, should increase in proportion as we retrace the progress of the one backwards, step by step, to its origin, in the latest developments of the other; or at least should continue to show itself in a connected series of links intervening between the two. But in this instance the very reverse is the case.

"If any peculiar modification of the pointed style can be said to present a very marked similitude to a group of ancient trees with their knotty trunks, their interweaving branches, and their luxuriant foliage, it is precisely and exclusively that last and highest development, which existed not until at least a thousand years after the last of the Druids had ceased to flourish, which arose last out of the rudiments of that pointed style itself, as well as out of the prior rounded style, which precisely, by showing most evidently its connected descent from the earlier and simpler pointed,

and the rounded architecture preceding that, proved itself not to arise immediately or mediately from any quarter not connected with these. Thence, as we ascend to the earlier modifications of the pointed, and from these to those of the earlier Lombard and Roman styles (out of which we shall show all pointed forms to have proximately or remotely arisen), we find these latter to have existed universally for many centuries intervening between the beginning of this later style and the extinction of the pagan rites; and thus to form a complete barrier to any possible filiation between the forms of the one and of the other. We find the similitude with the supposed vegetable type to diminish, until, in the prior genuine remains of the Druids themselves in France and in England, in the huge rude blocks of stone near Salisbury, and in Brittany, precisely where the resemblance ought to be most palpable, we see it disappear so completely, that, arrived at this point, the supposed Druidic pedigree of the pointed style can only excite a smile. Warburton's idea, therefore, more worthy of a fanciful novelist than of a grave divine and critic, should be discarded by others, as it was ultimately by himself; and as the objections to the entire trees, with root and branch, of the English bishop, apply equally to the insulated posts and twigs of the Scotch baronet, we shall leave them to strike what roots and put forth what shoots they can."

Now to return to what is known as imitation in architectural art.

Plastic art deals with the human figure, and depicts it in a state of animation at the moment when it expresses the emotion by which the artist illustrates an

idea. The muscular activity of the human frame is mechanical, and subject to nature's mechanical laws. Here we have, first, matter in motion subject to mechanical laws; and, next, that motion arrested. In a structure, the attempt of its author is that the relation of matter shall be stable from the beginning to the end of the process of construction, and that it shall remain so when the work is completed. The conditions which tend to disturb stability are of a mechanical nature, and are subject, therefore, to nature's laws of mechanics. Here we have matter in a state of rest in opposition to possible motion. Another distinction between the structure of the architect and the human form depicted by the sculptor is, that the human form is already built to the hands of the sculptor in accordance with the laws of mechanics; and it remains for the sculptor only to understand these laws, as exemplified in human motion, and to be familiar with the moving parts, such as bone, muscle, and tissue, in order that he may depict correctly human motion as seen in a model, or as imagined by him. The intervention of a possible model in this case may enable the artist to make up by close observation what he lacks in theoretical knowledge of physiology and mechanics; while the architect takes his material from the great storehouse of nature and the mechanic arts, and creates his parts of structure upon natural law entirely, dealing from the beginning with ideal forms.

But inasmuch as these ideal forms are as strictly amenable to laws of nature as those which govern the mechanism of the animal frame, the work of the architect, as carried on from beginning to end, and in its every detail, is in imitation of nature, being formed

upon her principles. The sculptor imitates natural forms with the knowledge of the laws which determine their special modelling; while the architect models his forms upon a mere theoretical knowledge of the laws which determine their creation. And both the sculptor and the architect proceed upon a knowledge of nature's laws, and in imitation of her methods, with this distinction, that the sculptor finds forms ready made to his hand, while the architect must evolve his forms from the idea (or its emotion), and impress these emotions upon the matter (which is the material at his command), with the help of, and in obedience to, the laws of mechanics. These laws, the idea, and the material, constitute the elements of environment of all architectural creation; and by this environment the architect must be led, directed, and urged to produce forms which are the natural result of the environment, and which respond to it in all its elements. If we bear in mind the following definitions relating to ideas represented in organized matter, when that matter is the human form, we can readily trace the application of these definitions to the architectural organism, by substituting for the word motion the expression "tendency to motion." An idea is a relation of matter, or an observed motion of matter in relation to other matter. An emotion is an observed form of motion of organized matter in consequence of an act (muscular and nerve motion), the result of an idea. Thus we may say of the ideal forms of architecture, that they perform acts illustrative of an idea, which acts are a condition of muscular and nerve motion, or a tendency to the same, which is, in all cases, an equivalent to an actual motion arrested. Hence the emotion expressed in matter as

dealt with in the ideal forms of architecture, is in all cases in imitation of the observed forms of the tendency to motion in natural organized matter.

We find in nature that the human frame does mechanical work, sometimes with the labor of the carrier of burdens, and then again with the ease of the athlete. It is these gradations of ease, grace, directness, and expression with which labor is performed, or with which mechanical work is done by the human frame, which furnish to the architect the elements of art expression in his structures.

Like the elements of all natural combinations which serve the purpose of artistic or natural expression, they are but few in number, but capable of an infinite series of artistic combinations.

When we enumerate strength, elegance, and repose, we have probably stated the whole range of the architectural gamut; but if we consider that each of these qualities may be endowed with an endless range of quantity, we can readily imagine that these mechanical conditions of matter may express endless varieties of ideas, from the dungeon keep to the tabernacle which contains the Sacraments in the church of St. Laurence at Nuremberg.

All natural organisms are possessed of the mechanical ability to perform certain functions. This ability we find more or less clearly expressed in their forms as a whole, or in their crystallization. In this way they convey to the mind an expression of these functions, and thus they tell the story of their being. The architect, in imitation of this natural condition of matter, so models his forms that they also tell the story of their functions; and these functions are always me-

chanical conditions of strength, elegance, and repose, in combinations of various quantities of these properties. The fundamental principle of the modelling of architectural forms is therefore mechanical.

This brings us face to face with an architectural question: "What are the relations of architectural art and mechanical construction?" which has in its time created much interest in a prolonged controversy. A large number of modern architects hold that the construction of a building relates merely to the personal convenience of its occupants, and to certain mechanical laws well known to engineers, which insure the stability of the structure; but that all this, though of economical and scientific importance, has nothing to do with architecture proper, which is an art that deals with the decoration of the structure outside and inside, which decoration alone is the art work, and that which makes the building beautiful. This is the view taken by Ruskin and his followers; and hence his great desire that architects should be sculptors and decorators, and leave mathematics and mechanics to vulgar engineers and builders. Others again say that the architect should know something of building, to be sure; but inasmuch as the masses used in architectural monuments should be inordinately large when compared with the masses which might be needed for mere technical perfection of mechanical work, it is hardly necessary that the architect should enter upon the subject of construction any further than is required to insure safety and convenience, and that he may delegate the whole subject to some clever builder or engineer, and begin his work when that of the builder is finished.

Another school of architects insists that methods of construction, to say the least of it, are an element of architectural art. They cannot shut their eyes to the fact that the whole evolution of mediæval architecture, as it culminated in the great cathedrals of the thirteenth century, is one of progress in methods of construction, and that all forms in late mediæval art may be directly traced to mechanical results of the vaulted roof.

Others go still further. They maintain that the physical organization of a structure determines its form, and that form is an æsthetic element not to be ignored. The majority of practising architects and late writers on architectural art, however, deny that architectural forms have any relation whatever to construction; that forms which satisfy the engineer do not please the architect, and that he may change them, therefore, in mass and in their modelling; that he may entirely ignore the actual construction, and overlay it with forms of another construction which serve as a mask to the real construction; and that his forms, as he may choose to select and combine them, although they doubtless originated in methods of construction, are constructive elements no longer, but pretty things arbitrarily combined to gratify individual whims (taste they call it), producing lights and shadows, to look beautiful, artistic, and odd—forms which shall appear to be something, but which are in reality nothing. In the whole range of architectural literature we find it nowhere developed, or even stated, how this work of combining forms, which at one time meant something, but which now means nothing, is to be carried on. There is no school in existence

which teaches the proper use of old forms, or a possible development of new forms. Each man is to govern himself in this matter as he pleases; he shall work for effects, grand effects, striking effects, palatial effects, homely effects, and grotesque effects. These effects are not results of special causes which may become positively known, but attempts to present something which is not; to produce a sham, an untruth, by means of individual enterprise. The effort of man to create things in imitation of his Maker is henceforth to be a pretence and a swindle; a collection of second-hand properties which may be palmed off upon a credulous and ignorant audience as real things by an unscrupulous scene-shifter. And so they are palmed off upon a gullible public, sharing the fate of all such deceptions—a momentary success and then eternal contempt. Hence architects change their forms and combinations of forms from day to day, to make up by novelty what is lacking in truth. And thus architecture has ceased to be an art and has become a fashion.

We may be sure of a truthful and exact answer to the question, "What are the relations of mechanical construction to architectural art?" if we conscientiously examine, not the quibbles of the schools, nor the authorities of past practice, but the nature of architecture as a fine art.

Architecture deals with ideas, and with ideas only. In the forming of a structure, it attempts to depict the soul of the structure, not merely to minister to the physical wants of its occupants. It further deals with physical wants, not perhaps as elements of fine art, but as important motives in transferring to a structure acts which may not well be performed elsewhere. And when

architecture is considered from a purely artistic standpoint, viz., as a fine art, it deals with forms which are primarily the result of physical necessity; and, secondarily, with the substance which is needed to express the idea. Can we analyze the relations of construction and architecture, or may we determine that there is no relation between the two?

The answer to this question must be reserved for a special chapter.

CHAPTER XVII.

IDEAS.

The observed relation of matter is an idea. That "*water is a fluid*," is a statement of its relation to other matter which is solid, hence an idea. An idea may be the result of our own personal observation, or it may be communicated to us by others who have seen the matter in relation. In the latter case, we derive our knowledge not by seeing for ourselves the matter in question, but by the substitution of other matter which we have seen. For instance, we may be told that chloroform is fluid and colorless. Our idea of chloroform would, in that case, be derived from water, alcohol, or any other colorless fluid. Yet we all know that upon a personal visual examination of chloroform, a person skilled in observing would discover a sufficient specific character in chloroform which will enable him subsequently to distinguish it from alcohol or water. We never know more than we have perceived with our senses; hence it may be said that all ideas are the result of sensuous perception. The definition of the idea, viz., a perceived relation of matter, determines its value. Defective observation and defective comparison will produce a defective idea. A sensuous perception of isolated matter conveys no idea; a comparison is necessary with other matter observed at some time. The

motion of matter constitutes an idea; but motion refers to a material point outside of the matter observed. In the revolution of a body around its axis, a material separation of that axis from the rest of the body becomes necessary to convey an idea.

Mathematical and geometrical analyses refer not to special matter, but to any body whatever in certain relation, or to the boundaries of matter, or its surfaces.

Space and time have been cited as ideas abstract from matter; but Leibnitz has defined space and time as confused ideas of the relation of matter in co-existence and succession.

Speculations on the infinite and immaterial are held to be mental efforts not preceded by sensuous perception. Unfortunately these speculations refer to terms and not to ideas. An idea must be defined before it can be recognized as such, and definition always involves matter. The argument upon the infinite and immaterial seeks its hypothesis in the finite and material. These terms have been paired in that order so frequently that they have attained popular currency in this relation. Unfortunately matter is not finite. There is no truth better established than that matter is indestructible. The only thing which is known to be finite is, in truth, not a thing at all, but a condition of things, a relation of matter, the only subject which can possibly become the basis of an idea.

A relation of matter may form a hypothesis from which by sound argument other relations of matter may be deduced, but the immaterial must remain outside of any possible chain of argument which can lead to an idea.

Ideas relating to virtue, vice (positive and negative

morality), comprising relations of man to his fellow-man, to the community, to himself, to God, the State and the Church, are all traceable to a solicitude for the preservation and continuance of human life and its subordinate sources, such as property, liberty, human rights, government, etc., which, when closely considered, mean the human desire to perpetuate life, a relation of matter which is the basis of man's identity. The desire for immortality is nothing more than the solicitude that our identity may not be lost hereafter. This identity, again, is known to us only as the relation of the matter which enters into the composition of our body. Hence it is that no reference to our continuance hereafter can be intelligibly formulated beyond this condition of identity which we know only as a relation of matter.

Whatever we observe by means of our senses may be subsequently recalled by what is known as the faculty of the memory, which is held to be a property of the mind or the soul. Reflection is also named as a function of the soul; but analysis does not show it to be anything more than the process of recalling previous sensuous impressions by virtue of our memory and comparing them.

Sensuous impressions are more or less perfect, according to accuracy of observation. The pictures we recall by force of memory never exceed in accuracy the original impressions; but are frequently defaced by other subsequent impressions and by the action of time.

Recent progress in science explains the processes of sensuous perception up to that point where the nerves communicate sensation to the nerve-centers. Of the

nerve process itself, we know nothing; nor can we possibly form any idea of how consciousness of what we see, hear, feel, smell, or taste, is communicated to the soul—a process involving the action of matter upon what is not matter. That the soul, an entity without matter, commands the action of matter, has been universally taken for granted, without satisfactory explanation of the converse, that the soul may be, and necessarily in this way is, affected by matter. What is more, the deterioration of mental impressions by time partakes so sensibly of a defect peculiar to mere matter that it must become doubtful whether the function of memory is not purely an affection of matter, a succession of organic changes in the nerve-centers, which may coexist without materially obliterating each other, somewhat in the manner of the passing of various currents of electricity through the same wire, the intersection of large and small waves on the surface of water, or the sound vibrations of a string in the case of over tones.

It becomes no man either to originate or to accept attributes of the Deity or the soul which involve either in the weaknesses and defects to which matter is subject; and we may prove our appreciation of the immortal part of man by referring the function of memory to a condition of nerve and brain matter.

The functions of the nerve-centers and the brain, in comparing sensuous perceptions, in recalling them by force of memory, and in directing muscular action, are now positively known to consume time (a mechanical condition), and to influence the circulation in the effort to renew nerve matter consumed (or, better, changed), and the magnitude of both the time consumed and the

extent of the change of circulation have been experimentally determined. Hence no doubt can remain as to the material nature of thought.

All relations of matter in which man has an active part by virtue of the exercise of his will, are termed ethical ideas. They are the great storehouse from which art draws its material, since art has at all times served as an instructor to man by illustrating principles of morality. Man has two sources from which he derives knowledge, the brain and the heart. This is the figurative, the poetical way of expressing the distinction made by Baumgarten between conceptive knowledge—the clear understanding which follows logical demonstration—and confused knowledge—the result of sensuous perception which follows the examination of works of art and of nature.

That the heart plays a part in conceptive knowledge is not entirely a figure of speech, and this fact deserves closer examination. The heart is the pendulum of the circulation, with which it beats in unison. The circulation of the blood is subject to material variation in consequence of emotions. There are emotions which will make the heart beat faster, and others which will cause it to stand still.

Now art, as we have seen in a former chapter, deals exclusively with emotions, and contemplates them arrested at a given point of their development. The idea, as it were, serves in this case as the hypothesis, the act as the argument, and the emotion as the conclusion.

In works of art or of nature we are presented with a condition of the object at the conclusion; and although we may afterwards reflect upon the argument

and the hypothesis, the upshot—the final result of the information—is placed in our hands at once. It is presented in the form of an emotion which claims our sympathy, and spares us the mental effort which accompanies argument; hence we arrive more quickly at a conclusion, but remain in the same degree ignorant of the nature of the analysis. This is what Baumgarten justly calls confused knowledge; a sort of knowledge which promptly but not quite effectually disposes of the case in hand. Hence it is that the influences of art and nature, to be of material benefit to man, must be frequent, and, if possible, constant, in their operation. We should take care, therefore, that ideas of life should find expression in every human act and in all objects which constitute our surroundings; that all functions performed by man, no matter how humble, shall be performed with a decent regard to their moral import as well as to their physical nature.

To clothe ourselves does not mean to cover our nakedness merely, or to protect ourselves against the inclemency of the weather, but to give expression to the human form, which never fails to respond to our emotions, in order that these emotions may continue to be perceptible, that they may restrain the subject within the limits of moral propriety, and may serve as an example to others. Immorality, by a law of nature, seeks concealment. Art should tend to the reverse of this, to constant expression. A man enveloped in the modern fashionable attire cannot be joyous or serious, affectionate or angry, affable or dignified in any degree, without becoming in a greater degree ridiculous. Dancing, which is a metrical movement to express human emotions, has, under the influence of modern

dress, degenerated into an unmeaning contortion and monotonous race. It has ceased to be possible to range men and women in poetic groups without first endowing them with a fitting costume. A procession of men in dress-coats and pantaloons never surpasses the dignity of symmetrically arranged scarecrows. We cannot walk, or dance, or sit, or kneel, without appearing absurd; hence we have abandoned physical action, and utter sentiment or wisdom with a sardonic smile which must freeze the most enthusiastic audience into contempt for anything outside of mathematical demonstration, or the statistic arrangement of facts in tabular statements. The conventional forms in which the hair and beard are now worn have done more to destroy the poetry of life, and have been a greater hindrance to art development and morality than selfishness, greed, and native meanness. If art is to become a living principle in so-called civilized countries, as it has been heretofore among the so-called heathens of Greece and Rome, among the Egyptians, the Hindoos, and Japanese, or among the Christians of the middle ages, we must begin by reconstructing our dress upon art principles.

It is said of the Roman Senate that it resembled an assembly of kings. Who will say the same of the British Parliament or of the Congress of the United States? Many members of both these bodies may be better fitted to be kings than most of those we read of in history; but do they or their compeers look, act, dress, talk, and bear themselves like kings? No, indeed; and why not? Because it is the affectation of the times to despise everything that pertains to mere form. We have seen the hollowness of appearances,

of dress, of manners, of form of all kinds; and we will have none of it.

This high-sounding bit of philosophy will not stand the test of examination. It is only the repetition of Plato's contempt for matter; but Carlyle tells us "that matter is a thing greater than man, a thing not to be comprehended by him, it is an infinite thing." Can the Speaker of the House of Commons divest himself of matter? Can he present himself to us without form? And why, pray, shall he prefer the form of a jockey to that of a king? Are the dandies and the doubtful women of Paris infallible authorities to decide for us the form in which God should have made man when he did not.

Wisdom may not be unfavorably affected by slouchy habits and awkward gait, or the unimpassioned droning which takes the place of speech; but it is a serious and all-important question whether morality does not suffer from the unpoetical habits of the age. A man will commit a mean act under the influence of mean surroundings; and even Diogenes might have been a better man in a decent cottage than in a tub, for the simple æsthetic reason that a tub in its form and construction represents a receptacle of fluids; while man, considered as matter, must be classed with the solids.

The moral effect of art expression becomes greatest, however, when contemplated in its influence upon the masses.

If Parliament met upon a secluded island, and the members were all philosophers, they might in dress and habit neglect all outward expression, and stand like animated milestones when they address the Speaker. But when we consider that the wisdom of the legis-

lator becomes apparent to the masses more by his manner than the substance he utters, that the people recognize the merit of an ambassador or prime minister not from what he has accomplished, but from the fact that he has been made a Knight of the Garter, a duke, or an earl, the necessity of outward material demonstration of art influence in all acts which are of public import becomes evident.

Abstract knowledge is a limited sphere of bright, brilliant, white light, which sends its rays far into a dense and moist atmosphere, where, by aberration, reflection, and refraction those beautiful colored light-pictures are produced which we see at the rise and setting of the sun, and which constitute the light of art, the mystic knowledge of the people. You cannot, as some philosophers would have it, force those direct rays beyond a certain limit, and you cannot collect humanity within that narrow limit of pure white light. Why then build up an artificial screen and deprive the mind of the masses of that charming sea of floating colored and silver clouds, wherein they see a glimmer of the light of their being, simply because they cannot see the light itself?

And so the Church of to-day has weakened its influence with a sham appearance of stoical philosophy.

The statesman may say, with some show of justice, that he deals with the white light of political economy, that his arithmetical figures and tabular statistics need not the poetical help of art to become visible to his brother statesmen; and that the masses never will understand these in spite of all the pictures he may paint in gorgeous array, in processions, in grouping, and in declamation.

True, this is unsound reasoning, because the people may be made to respect what they but dimly understand, and morality may be the gainer by it. But can the priest hold the same argument? Can he say that he deals with pure logical demonstration, or that it is not important that the masses should know that which he presents to them as clearly as he does himself? Are not faith, dogma, and rites in themselves pure and unadulterated art, which, in mystic form and high-wrought colors, concentrate the vivid rays seen only by Brahma, by Moses, and the Son of God? Shall we not picture Him crucified, and yet believe in transubstantiation? Shall we not carry in procession the likeness of the Mother of God, while we are called upon to believe in the Holy Ghost? Are we to cease worshipping the saints because they are mere men, and confess our faith in the Trinity? If the poetic expression of human emotion is to be abolished because it appeals directly to a figure in stone, why, then, let us condemn the stone, but substitute something more fitting to sustain the emotion. If saints will not do, nor the gods of the harvest, then take the harvest itself and carry it in procession—flowers and sheaves and fruit—anything in the shape of matter which will express an idea, and which will move men's hearts. Do you think that men can be moved to morality, piety, or religion in any form by lounging in soft-cushioned pews and listening to a sermon? Do you know what these men and women are doing while they appear to listen to your words? They are either thinking of something which interests them more, or they are weighing in a critical balance the amount of erudition and natural ability which is contained in your literary performance, and

remotely, perhaps, whether its market value is up to the standard of your salary. Gather up all these thoughts, ye architects, and see what sort of a monument will express them in matter.

It may be asked here, Are the clergy of the nineteenth century ignorant of the emotional elements of religion and art? Are pastors of Christian churches indifferent to the true interests of their charge? Are they indisposed to do the right thing when they know it?

Architecture is indebted to the church of all ages for its existence as a fine art, and it may be stated as a rule that the priesthoods of all nations are the true patrons of architecture, sculpture, painting, and, indirectly, of music. The clergymen of the present day, taken as a class, have, in the turmoil of business, of politics, and of scientific pursuits, and in spite of the pressing necessities of worldly competition, preserved a loyal interest in what is true and good, independent of all immediate results, and in a measure far beyond any other class of professional men. The pastors of Christian churches of the present day are endowed with a general education superior to that possessed by the priesthood of any other people and of any other time. Their devotion to the task which they undertake, their conscientiousness in the means selected to carry it out, a strict morality, and a pure life, cannot be denied them. But yet this enviable condition of things brings with it, like all other human conditions, its own peculiar difficulties and defects.

Liberal education has so far removed the priest from the people that he cannot clearly see how absolutely his parishioners are dependent for their education upon

the confused knowledge afforded by art; he is led to think logical methods quite sufficient to ground and maintain them in the dogmas of faith as still held by the church, and to sustain habits of morality, zeal, and conscientiousness, without the aid of that poetry which will make it an outcome of the heart, rather than the conviction of the head. The priest has learned enough of logical deduction to doubt that others need any other help to carry them to the goal of ethical perfection, and yet not enough successfully to convert the pulpit into a rostrum, and the church of God into a theatre of learning.

Standing at the circumference of the great circle of white light, privileged to look within and without, undetermined on which side of this boundary his lot is cast, he occupies the singular and doubtful position of combating art as a detriment to religion, and science as a contradiction to it. Trained in practical life by the reforming tendencies of the times, he has acquired a habit of protesting, and has educated himself into a militant against thought on the one side, because it is supposed to endanger his system, and against poetic development on the other, because he wishes to purify that same system. Resolved to wipe from the memory of men what he terms the superstitions of the church, by banishing every physical demonstration, every poetic act which may remind man of the hated dogma, or which may foster affection for condemned practices, he has forgotten to replace these material incentives to religious emotion by others better suited to his purpose; and in his zeal to tear down he has omitted to build up again; and now finds himself houseless, and without shelter, exposed to the burning rays of the

light of science, and the pitiless chill and sleet of popular indifference.

A large and very respectable class of modern clergymen are strongly convinced that all this is wrong, and yet have not arrived at that point where such a conviction leads conscientious minds to the right. Conservative habits prompt them not to a radical reconsideration of the subject, but to a sighing for the flesh-pots of Egypt, and a return to the ecclesiastical forms of the thirteenth century. Opposed to forms of one kind, because they express something in which they have no faith, they seek forms of another kind which express precisely the same thing, deceiving themselves into the belief that these forms, after all, mean nothing in particular.

What is the Church to do under the circumstances? Like a prudent general, it must first of all reconnoitre the position of the enemy, and then boldly resolve upon and occupy its own. Religion means instruction,—an answer to various metaphysical and ethical inquiries. The text-book of Christian instruction, the Bible, contains no metaphysical reasoning in explanation of our being, the existence of the Deity, the immortality of the soul, or to prove the *rationale* of the moral precepts enjoined. The passages devoted to the law, to rules of life, are very short and of rare occurrence. The mass of the work may be pronounced to be a poetic history, painted in word-pictures, which point a moral lesson.

Many of the precepts contained in the books of Moses are set aside by the New Testament; and the latter contains parables which are avowed to be merely instructive, and which have been variously interpreted. Indeed

the whole work is received by us in the sense accepted by various commentators, and its interpretation has undergone changes within the limit of the times of modern Protestantism. Christian nations accept it as a fundamental law, which shall govern every individual; and necessarily, also, the State. We find, however, the criminal code of England to have abolished the death penalty for forgery and theft, with the approval, or at least the acquiescence of the Church, though it does not appear that the Christian clergy protested against these laws during a continuance of many hundred years. Recent geological research has changed the interpretation given to the history of the creation as contained in Genesis, and various astronomical facts are readily accepted by the Church, though they have been heretofore contradicted by reason of certain passages of the Scriptures. It is now admitted as a rule, that the terms in which various phenomena are treated in biblical history, are adapted to the special popular knowledge of the times; and mean, in fact, not what is there stated, but what may, at any time, be the accepted explanation of those phenomena.

To look at religion from a stand-point outside of Christianity and the Bible, we must be convinced that it has always existed for the purpose of answering man's questions asked of nature, and of regulating his actions. This purpose it has answered at all times, though it has itself changed in form and substance. Thousands have died the most cruel deaths upon the scaffold; thousands more in the wars waged to maintain religion in its existing forms. Yet it has changed and will continue to change until the end of time; yet man respects its function in life, and obeys its pre-

cepts; and these are ever the same, and ever will be.

The means of religion to make itself understood, obeyed, and respected, is art, and art alone. The means to modify, and perpetuate, and adapt it to man's condition, his state of knowledge, is again art. It has no enemies but in its conservative advocates, who cannot comprehend the necessity of change in a system which they have received as final and immutable, in spite of the facts that history is mainly the history of former changes, as future history will be of the changes of the present time, and that it depends entirely upon ourselves whether these changes shall or shall not be accompanied with war, and bloodshed, and human suffering; or whether we may not, by holding on to the substance of human morality, and to the means of human art, and to the conditions of human intelligence, make religion still the great lever and constructor of human happiness.

The priesthood of the Christian Church is sensitive to every theory advanced in science, for fear that it may contradict some innocent simile in the Bible. Now geography, natural history, botany, chemistry, are all positive sciences; yet no one would be startled to learn that an error had been found in the latitude of the Fiji Islands, or in the classification of certain crabs or algæ. When these corrections come well authenticated, they are cheerfully adopted at once. But yet, if they should be errors, no one is angry or frightened; no one will dream of collecting all the school-books which contain these errors and burning them; no one will even prohibit their circulation. The moment they are convicted of errors, they simply

drop in market value, and drift quietly into the paper-mill.

The substance of religion is contained in its art work. Illustrations of human existence, of human relation to the universe, and of the moral conduct of man, are painted in word-pictures to express the metaphysical thought of a certain time. For instance, the rule of "eye for eye," and limb for limb, is no doubt a proper precept in troublous times, say while a nation is on the move, emigrating to a new country, and of necessity under the discipline of martial law. Change the condition, as when the same nation lives under a strong and effective government, like that of the Romans of the time of Christ, supplied with all the paraphernalia of public surveillance, a standing army, well-organized criminal courts, etc., then the other precept, of the "turning of the left cheek," may be the better rule of conduct for the simple citizen. There is not a poem or a novel written at the present day wherein are not introduced, to the great moral edification of the reader, divers heroic characters who exemplify precisely the same opposite views of propriety of conduct without giving umbrage to the most fastidious critic. What is demanded of literary art work is that heroes shall be painted with truth to nature, and in imitation of her laws and principles. You cannot go amiss; you may paint an honest man or a thief, and the result will be a lesson on the side of morality. But a previous condition is, that you must *paint*, you must produce a work of art, or else your effort is a failure.

The Church also must *paint;* it must present ideas in matter. Its matter is the congregation, the clergy who lead the service, the choir which conducts the

music. All these may be used more or less in the performance which is to be the act illustrative of the idea.

The ideas of religion are immutable; they are the relation of man to God and his fellow-men. The acts are changeable—the worship of the sun, the sacrifice upon the altar, the libation, the partaking of the sacrament. Think for a moment of this last simple act of pious men who break the bread and drink the wine in commemoration of their communion with Christ. What a magnificent picture, when, on the sounding of the sanctus bell, the congregation kneels in momentary silence! You are not in favor of the continuance of this great emotional performance; you dislike it because it is the invention of a set of men who, some hundreds of years after its institution, were convicted of the heinous crime of selling indulgences. Be it so; you are only exercising a natural right, an inherent privilege of the priesthood of any time and of any country, when you boldly wipe it off from the face of the earth. But you must substitute another method for it to commemorate man's relation to God, or else man, the average man, will cease to feel that there is such a relation.

Ah, you say, in that case you will see to it that he shall know it instead of merely feeling it; that you will personally demonstrate it to him from the pulpit, and convince him of it.

To demonstrate, to convince others, means to *know* yourself. What do you *know* of God? If you should assert that you do know God, you will constitute yourself the boldest sinner of your congregation. You may believe in God; but to say that you *know* him, you

must be either a God yourself or a pretender. What can we know of time, and space, and eternity, of things immaterial in any sense? The moment you attempt knowledge in that direction, attempt a definition of the Deity, of his attributes, of his acts, or of anything pertaining to him, you are guilty of sacrilege, of a presumption the impiety of which has no equal in human audacity.

The knowledge of God which man may speak of without sin, is the confused knowledge of nature, and man's humble effort at imitation of it in art. As you see him reveal himself in matter, even so is your knowledge of him—confused, uncertain, fragmentary, adumbrative, nowhere and never absolute, and in that sense only can you convey it to other men; and your personal feeble literary efforts in that direction are insufficient for the work. You need Nature and Art to help you, in fact, to do this work for you. And if you succeed in directing it in part successfully, within the limits of your understanding of it, you have done all that can be expected of you.

But, says yon young priest, recently ordained, "I am the ambassador of the Most High, as he has revealed himself to man, and I proclaim him with assurance and without sin." True, precisely so; this is the gist of the argument, "as he has revealed himself to man," in nature and in art, in pictures such as may be understood from time to time, and which may fit either a condition of progress or one of retrogression. These pictures you must learn to know, that you may interpret them according to the knowledge of men and of your own time. Their true and full import you never will know. Even Moses was enjoined to cover his

face that he might not be overwhelmed by the glory of God. Man cannot *know* God and live. This is the substance of God's message to man, which you are commanded to convey.

As the Church groups men in worship, so may the architect build the visible Church in unison with these groups. For this part of the work he must look to the Church for direction ; it is there where his function begins. But if the Church have no conception of its duty, of this peculiar element of art which it alone can originate, then the Church, as a structure of fine art, becomes impossible. Could a Phidias give expression to the human form if God had made man in the shape of a cylinder without features to express emotion?

If the story of Helen and Paris were to be enacted over again in our own time, it would figure in the journals of the day as an "elopement in high life," or as a celebrated divorce case; the Iliad would be impossible.

CHAPTER XVIII.

MONUMENTS.

What is a monument? Every expression of thought in durable form is a monument. Whatever we say, write, paint, or cut in stone, or cast in metal, is a monument. If the thought we utter is a wise one, of importance to mankind, the monument expressing it will be prized by men, and will endure accordingly. If it be built in stone, and the stone decay, another monument will soon replace it. A word spoken, if it be wise and expressive of an idea, will endure like the pyramids. If false or frivolous thought is monumentally preserved, it is to the discredit of its authors as long as it lasts. Vain thoughts, untruths, verbally uttered, are soon forgotten; when put into print, in books, in periodicals, and in newspapers, they haunt men until they find their grave in the paper-mill. When embodied in stone or metal, their duration is extended to the discredit of their authors. An idea may not be absolutely true, and yet, if it be conceived in charity to man, and represents the highest intellectual effort of an epoch, it may still live and be respected, although superseded by another idea much nearer the truth. Man may continue to cherish it as a human aspiration of truly divine significance. Various scientific theories, and most of the religious systems

of the past, are instances of the kind. And the latter continue to exist in painting, sculpture, and poetry; while the former constitute no inconsiderable part of the history of science, where they are mentioned with due regard for the ingenuity and learning of their authors, although their fallacy has been long ago demonstrated.

It is the province of architecture to express ideas by structures. All structures, consequently, are architectural monuments. A structure may, however, express an idea it was not intended to express; perhaps the very opposite of that idea. The man who builds a dwelling according to the fashion of the day to live in, or to sell, as it may be marketable, is building a monument which does not reflect his personality, but simply the conventional sentiment of the masses. This may be thus summed up: Well-to-do people of the nineteenth century require a certain amount of creature comforts and a certain amount of display; to obtain all this with the least cost is the main thing. Another has mastered this principle in architecture, that his house must not be a monument to any and every one, but to himself. He would, however, have himself reflected in his dwelling, not as he is, but as he would like the public to believe him to be. The critic will not accept such a monument as architectural art, but will class it with other species of public advertisement, in which advertisement the public will put no faith.

If a man, however, tries to build a house which shall be as good as he can afford to make it; if he does nothing for show, and everything for structural integrity; if he builds it so that it may serve his pur-

pose, then this house will be a monument of this purpose. If he be a person who invites friends to enjoy his hospitality, or if he lives entirely for his family; if he reads much, or plays much, or makes eating the main business of life, his house will tell the story truthfully, and become a monument of the man.

But, first of all, in order to create a monument it is necessary that its author should be conscientious, and that he should respect the thing he is doing. He must not look upon it as a mere makeshift for certain physical needs, but as a worthy manifestation of mental functions. To illustrate: It is proper and right that, in a ship, which is not a work of fine art, but one supplying a temporary necessity, every nook and corner should be utilized. A locker may be placed under the stairs, over a berth, or in any convenient place in the saloon; we may crowd the passages and stairways into spaces limited by the necessities of the passengers and the crew. In a gentleman's dwelling such a proceeding would be vulgar; for this is not a shelter merely, but a residence. A certain liberality of space and a dignified order of things forbids as an art necessity the use of space for two or more purposes. Otherwise we fail to express the proper functions of the part we are treating.

There is also another fundamental principle of art work. We should not resort to mechanical expedients, no matter how sound in themselves, because they are desirable only on economical grounds, if they are lacking in, or detrimental to, clear art expression. If an acre of ground is to be protected from the weather to make the space available for a rolling-mill, for a car-house, or for a depot of lumber, and this can

be economically and well done by an iron truss from wall to wall, it is the thing to be done; but such an expedient would not conduce to art expression in a church, a theatre, or a legislative chamber any more than the hide of an animal would furnish a substitute for a properly organized garment. We are not supposed in a monument to grudge the space or the material that is needed to show that mechanical work is well and easily done, the result of which is repose. We should not resort to a trick in the matter of construction, for to the educated mind it must seem unworthy of the purpose, and to the masses it suggests no idea but that of meeting a physical necessity. It must be remembered that a work of fine art is the expression of an idea in matter. Matter, therefore, is an all-important element in an art production; it alone affects the senses. In any mechanical organism massiveness is a visible guarantee of stability; reflection must not be required to bring about conviction that the organism performs its functions, more especially as most persons who are affected by it are incapable of such reflection.

In the erection of a monument, self-denial should consist in refraining from unmeaning display for the sake of show. Architecture is popularly held to be the art of decorating a structure so as to make it appear beautiful. This is true or not true according as we understand the beautiful. It is supposed that a structure may be made beautiful by piling upon it a multitude of pretty things to hide its construction, which is supposed to be commonplace, merely the work of the builder and the engineer.

The error contained in this notion is twofold. First,

there is no beauty but that which results from a forcible, clear, and successful expression of the idea in matter. Expression can be found only in depicting features which vary in dignity, magnitude, power, and force of action. It is clear that expression must depend on the amount of character in various features of the structure; that is to say, we must make one part more dignified, more ample, more strong, more forcible than another, and attain to as great a number of such possible differences as there are classified features in the structure under consideration. Now this can be accomplished only by an ascending or a descending scale of decoration fitted to express corresponding features of the structure. We must gain expression by making parts plainer than others, as well as by making parts richer than others.

Secondly, plain constructional forms express functions fully and directly in obedience to nature's laws. When constructive expression is heightened by decoration, it tells more plainly and promptly the nature of the functions performed by the organism. The laws of mechanics, however, are the only guide to a true system of carved and color decoration; and if these laws are not duly regarded, there arises a discord between the expression of the masses and that of their decoration, which detracts from the expression of the whole. In this case it were better that the masses were not decorated.

In creating a monument, the problem is mainly to give expression to the acts performed within its walls, which is done by giving to the structure a form which will correspond with the groups performing these acts, and to its parts such masses, modelling, carved

and color decoration as will express precisely the degree of stability, dignity, and elegance which corresponds with the import of the acts to be expressed. The form of a monument is determined, therefore, by the human groups which are accommodated in its interior, and must contain as many single cells as there are prominent groups. The expression of strength and elegance must relate to the mechanical functions performed by structural parts, and is, therefore, referable to mechanical laws. It is the purpose of every architectural monument, also, to supply such physical needs as shelter and comfort to the persons who occupy it; and we may, therefore, sum up the conditions which surround the creation of a monument, as the idea which called it into being, the acts which illustrate this idea, the emotions which are produced by these acts in the human groups which occupy the structure, the degree of strength and elegance which corresponds with these emotions and with the nature of the materials which serve for the erection of the monument, and the knowledge possessed by the author of the monument of both the mechanical and æsthetic relations of the matter which serves to form the organism of his structure. All these conditions appertaining to the development of monumental forms may be likened to the environments of natural organisms, with this difference, that the art force in natural organisms is absolutely adequate, while in an art work, created by human effort, the degree of creative force varies with the ability and learning of the artist. But it must be clear that man cannot invent artistic forms, but that he may permit himself to be led into the development of forms in precisely the same way as nature

develops her forms. In nature environment compels functions, and the organism fully responds to these functions; hence it is possessed of perfect expression. In an architectural monument the functions of the structure are first determined, and next to these the methods of expression, all of which is in imitation of nature by referring development at every stage to nature's own laws pertaining to such organism, viz., the laws of statics. Hence these laws, together with the nature of the fundamental idea which is the origin of the monument, the material of which it is built, its situation with reference to the sun, the climate of the country in which it is built, constitute environments of physical development, which must be understood and responded to by the architect.

The development of monuments in the past, however, does not show even an approximation to a prompt and full appreciation of the conditions controlling the creation of monuments by those who built them. Antique and mediæval monuments reached perfect development at a time when the ideas which called them into being had long culminated and begun to decay, if that term can be used in relation to an idea—undergoing a change in its nature, or yielding its place to another idea related to it indeed, but so materially modified as not to be readily recognized as the same.

The monuments erected under Pericles, those of the Roman empire, and the cathedrals of the twelfth and thirteenth centuries are all illustrations in point. The decay of Catholicism, and of the Polytheism of Greece and Rome, occurred simultaneously with the perfection of the monuments illustrative of these religious ideas.

We find the same phenomena in the celebration of mediæval social and political conditions in the poetic works of Shakespeare at the close of the Middle Ages, when these social and political conditions had already undergone such changes as pertain to the beginning of a new era. The most potent cause of this is the fact that the poetical embodiment of human relations is not premeditated, but, on the contrary, a work of slow growth. The present is to us always matter of fact. We see in its conditions only so many obstacles or helps to physical well-being. Religious, social, and political opinions, and the customs, practices, and material demonstrations growing out of them, appear to us the essence of reason, a phase of mental emancipation from past error. We do not recognize them as poetical revelations of partial truths, because we deem them to be absolute truth. Only when we begin to discover that our physical interests demand theoretical changes in the fundamental ideas of our social fabric, and these changes are initiated, the opinions and practices of the past become mythical, become pictures of a human condition which acquires a poetical and picturesque value in the precise degree in which its real and actual value as a means to promote practical interests begins to diminish.

The mediæval armor is the necessary practical accoutrement to resist mediæval arms, and the mediæval castle the monument of a social condition based upon physical force, and a code of honor and duty arising from it.

Mediæval religion is the outcome of the physical human relations of the time, the philosophy which makes possible the existence of the weak in the pres-

ence of the strong. The defects and the poetry of both (the social condition and the ethical code pertaining to it) are recognized simultaneously; and the ideas which caused their being are celebrated in poetry and architecture at the time when they begin to yield to other ideas which are determined by other social conditions. All this is perfectly consistent with past practice, and perhaps also sufficient for the human interests of the past. At the present time, however, it becomes a serious question whether the rapid progress of thought, and the more general acceptability of new ideas, does not demand a philosophic development of art expression of ideas which will keep pace with general progress, in order to afford to the masses that instruction which can by them be derived only from works of fine art. The only fine arts which can be said to foster modern ideas are poetry and painting; and the one above all others which fails to do this is architecture. The reason is obvious. Architects of all historical periods depended for a poetical realization of ideas upon the Church, and upon the sister arts, poetry, painting, and sculpture; or, in other words, the architect did not realize the import of social and religious ideas any sooner than the mass of the people of his time. Yet the architect of the past, up to the fourteenth century, lived in the midst of a civilization wherein thought found constant expression in poetical demonstration. Every species of occupation in life, every rank of society was strongly marked by expressive costumes. Holidays, feasts, and processions, convocations of the clergy, or the professions and the guilds, gave material utterance to every shade and gradation of social and religious life. In the absence of ready

methods of communicating thought to the masses of the people in words, every idea developed immediately crystallized into forms in which it could be conveyed to those interested. The period since the Renaissance has been devoted to a gradual but steady destruction of forms and material demonstrations of all kinds. Modern dress, at least the dress of the so-called civilized world, has worked a revolution in the outward form of society by assimilating all persons, and by depriving all equally of the form with which nature has endowed them. The divine right of kings is steadily yielding to a greater fallacy, the equality of all men. The despotism of the Church, which points to the infallibility of one man, is promptly rejected,—to be exchanged for what? The doctrine of the infallibility of all men, or, as it is called in Protestant technical language, the right of every man to read and construe the Scriptures for himself. The social distinction of birth, based upon remote personal merit in some ancestor, and upon probable education and good breeding in the person who enjoyed it, is being rapidly abrogated to make room for the theory that the claims of no one are to be limited by an exaction of personal merit.

The human race has discovered that certain social and religious dogmas are not absolutely true, which is no doubt a great gain, and betrays reflection and wisdom. It is a hypothesis from which valuable conclusions may be drawn, provided we apply a sound logical argument. But, upon the positive side, modern common sense has brought forth nothing better and nothing more than the wonderful proposition that a false idea is converted into a true one the moment it is changed

in any manner whatever. If the sun is not in the east, then it must be in the north; if continuous rains ruin the crops, constant droughts will preserve them; if the moon is not made of silver, then it must be made of green cheese. All this might do no great harm to society, since to exchange one false theory for another is not necessarily a loss, if the conviction had not gained ground that all metaphysical questions are now absolutely solved, that religion has become a science and government is in that happy Utopian condition wherein every one governs himself, and everybody else, without restriction; that, furthermore, forms and material demonstrations are unnecessary to a nation of philosophers, that the picture language of art is no more needed in actual life, and must find its level as a mere means of popular amusement. The conceit is abroad that the worship of God is nothing but a philosophic understanding of his nature, and prayer an expression of popular or personal opinion, somewhat the same as a petition to Parliament, or to the Lord Mayor; that the national legislature is a species of debating society which is governed by mere mind, and can afford to be oblivious of matter; that a court of law or justice is a place of ready reference to settled codes, and a judge a convenient index for such a reference without any further social import; that all men are equal, because they all wear the same dress, and that everybody knows everything absolutely, and needs to defer to no one for any purpose whatever. If it were not for the novels we read in our youth, the plays we see performed on the stage, and the music we hear everywhere, we should have long ago discarded all notions of faith, morality, and patriotism, and erected temples to pounds,

shillings, and pence. Under these circumstances it becomes the duty of the artist to realize the nature of current ideas, and to represent them in matter. The architect, at least, cannot afford to wait until the ideas of the time have been artistically rendered in poetry, nor until those of the Church have been so rendered in art. If the Church is to assist him in this effort, it is quite clear that he, the architect, must initiate the process; for it seems certain that the Church as a body is oblivious of the necessity of it, and so are the courts of law and modern legislative assemblies. All these need the regenerating influence of art to make their moral import understood by the masses. The period of the Renaissance is one continuous effort to tear down every material expression of reverence for gods, divine and human, who have heretofore embodied human virtue and human aspiration; and in place of these is left, not a philosophic digest of the abstract ideas expressed by them, but a materialistic reduction of all things, of all interests, of all institutions, to money values, the only unit of measure of the present time. Art, and more especially architecture, has ceased to deal with ideas; and hence construction (the law of mechanics) has lost its value as a method and a means to develop forms. For the last three hundred years no new forms have been created in architecture. The ability to express ideas in matter, if it exists at all, is not looked upon as an element in art creation. Ideas, moreover, have not been artistically materialized during the same time; and, what is more, in the Church no positive ideas have been developed. Shakespeare and the architects of the thirteenth century celebrated in art work mediæval ideas. A modern Shakespeare and

a modern architect can find in the Church no ideas of the immediate past which may be celebrated in art. If architecture is to be revived, we need first a revival of positive ideas, and next a poetic translation of these ideas into human acts.

The question will be asked here, Is society to place itself in the hands of a skilled stage-manager, who is to train it to perform the business of life with the decorum which is befitting an exalted code of ethics? To this we must respond with a decisive no! Human acts, like art forms, cannot be invented; they must grow, and they will grow, too, provided the ideas which they illustrate are of such a nature that they will germinate. Now ideas germinate under conditions opposite to those of nature's germs. The latter must be placed in the dark. Ideas, in order to germinate, must be placed in broad daylight. This means that those who subscribe to them must also believe in them and avow them publicly. That men do not believe in ideas currently promulgated is but too true; and it is equally true that they dare not express those ideas in which they *do* believe.

The modern popular hero who rides into power upon the wave of the elective franchise is ill calculated to become a material embodiment of ideas in which men can believe, no matter how vociferously they may be proclaimed from the hustings. Art affectation which clusters around paltry oddities, over-estimated merits, and accidental curiosities of the monuments of the past, and seeks inspiration in attitudes, in mannerism, in studied imitation of foibles and fancies which have no meaning at present—perhaps never had any—does not cherish ideas that men are willing to adopt as their

own, and to support which they will sacrifice their substance.

Fortunately it is not given to man to dictate a code of morals which is to govern others, and which he himself may subvert with impunity. If he attempts this, the result is a constant upheaval of society, and such a succession of violent agitations and revolts as we have seen during the past century. Nor can he set up a false code and have it obeyed. In fact, morality is a law of nature—eternal, determined, unalterable. What man can do is to prescribe the form in which this law is to be taught, that is to say, the art form in which it is to be clothed; and to see to it that this art form shall at all times correspond with popular intelligence.

Nature has established sacraments which man must respect and celebrate in some form; and, what is more, his life must be a practical embodiment of the truth they teach; and, if so, he will in all his acts illustrate and represent them. They are the laws of God, as we see them exemplified in nature, the truth they teach, the rights and duties of man which they determine, the claims of the weak and ignorant upon our help and charity, the friendship we owe to those who befriend us, our own unblemished honor, our loyalty to the state, our industry in serving our race, our honesty in dealing with men and things; and, finally, the hope that we may add to the stock of knowledge—that our thought, our ideas, may live after our mortal body has merged in cosmic matter.

It needs no extraordinary powers of the imagination to conceive and realize how and when these sacraments may be celebrated within and without the Church, and how they must become fruitful of acts, to perform which

we need poetic groups whose emotions must give rise to an endless variety of art forms, which, in their turn, will do their share in the education of man.

The confessional, the mass, the saints, and all the methods of Catholic worship pertaining to these, are examples of material expressions of ideas as created in the past. They must continue to command our respect, and will continue to live in Christian poetry. We have discarded them. We should now prove to the world that we are capable of replacing them with other and better expressions of religious ideas. If the present class of recurring religious, social, and political questions should condense and crystallize into tangible ideas worthy of the intellectual condition of the age, and society should, upon sober reflection, discard the aberration of the so-called fashions, and apply itself to clothing its thought in dignified and speaking art forms, then architecture will be able to respond to the demand made upon her. The architectural mind, which is now filled with multitudes of created forms, may well doubt whether new forms are a possibility; but as long as ideas are developed, fitting art forms to express them will be the logical result, provided architecture remains a living art.

A moment's reflection will show that architecture, in spite of the goodly age of this globe, is still in its infancy. We have seen in a former chapter that it deals with single cells, groups, and piles. In truth, the art has not yet fully risen above the single cell. In mediæval architecture we certainly find groups of cells and exceptionally rambling piles; but the former are not fully developed, and the latter are mere accident, not premeditated—hence not art work in that

sense. In early human monuments, as the Pyramids, it was required that they should be enduring, and the expression of their import was sought solely in magnitude. It is but natural that the symbol to express greatness which first presented itself to the mind of man should be physical magnitude. Modern architects are still somewhat possessed by an art superstition of this kind. Magnitude is cited as one of the elements of beauty, and this question is seriously debated somewhat in this wise: The larger a monument, the more impressive, the more beautiful it is. Is there any limit, then, to this largeness? For if magnitude constitutes beauty, unlimited magnitude must be the correlative cause of unlimited beauty; and this leads to serious practical difficulties. The answer made to it is not as logical as the question. It is held that the magnitude of a monument should not exceed what you can overlook from one point of sight. This can be true only when the monument is the result of an isolated idea, or of a single act illustrating an idea. If, on the other hand, there are a series of acts to be represented, it would be well for the clearer representation of the idea in matter that we should observe the various acts in succession. Moreover, these various acts and emotions are not of equal importance. Hence different magnitudes must come into play, and the rule, "the larger the better," must yield to some sort of system whereby magnitude is determined, not perhaps in feet and inches, nor in diameters of columns, nor in magical numbers, but by a rule of relation which shall apply in all cases.

The eagerness to build high towers in connection with mediæval cathedrals is a remnant of this crude

art system; and the method of placing these towers in immediate connection with the nave, or, what is worse, over the transepts, serves as a striking proof that the single cell was ever present to the mind of mediæval architects. The force which is inherent in the tower is belittled by the proximity of the church, and the idea of power to be imparted to the church is frustrated by the proximity of the tower; or, in other words, as cathedrals are arranged, the tower belittles the church, and the church belittles the tower. The cathedral without the tower is a melody which relates dignified ideas in a masterly manner; the tower is the base note, well calculated to strengthen the score. A visible separation, however, of the two is needed fully to attain the desired effect.

Another strong indication of the prevalence of the single-cell system is the crystallization of the cathedral masses around a central line. This is what is usually known under the name of symmetry. It is a fundamental law of both art and nature, but does not extend beyond the limits of organisms of a single function. In nature the moment there is a change of function there is also a change of crystallization in magnitude, form, and direction. Art, to be in imitation of nature, must utilize this very important fact by accepting it as a law, and will thus gain in the expression of the idea.

The composition of architectural groups is a problem reserved for the future, and must be perfected before the relation of architectural piles can be successfully considered. This opens to us a vista of activity, which, when fairly reached, will generate works compared to which the cathedrals of the middle ages and Greek

and Roman temples are the alphabet of art. There are but few notes in the octave, but few colors (pure colors) in nature; but the development of music and color decoration depends more upon combination than upon the number of original elements. Architecture must seek its ultimate development, and will find it, too, in the same way.

The monumental stone, or what is popularly known as a monument, deserves a passing notice in this connection. The architectural conception of it is to-day nothing more than what it was originally, a mural stone. True, it is not a rude stone now, it is modelled to distinguish base, die, and cap. Sometimes it is treated as an obelisk, and in mediæval architecture it assumes the form of an open chaplet not infrequently surmounted with a steeple. In no case, however, has it attained to the dignity of a structure expressive of an idea.

It is true that the rude stone, as well as the stone architecturally treated, is by no means devoid of the idea. It presents always an emblematic reminder that some one who has served society in some way is here commemorated; but it does not tell us who this some one was, nor what he has done to be remembered. Architecture is evidently cognizant of this defect in its own system to express more directly by a monument the person commemorated, and resorts to inscriptions and sculpture to supply the deficiency. The Prince Albert monument may serve as an illustration of this. Now Prince Albert certainly rendered great service to the British nation. Born and bred in a country where in our day an atmosphere of profound thought affects even princes, and called to a station

where that direct shaping and modelling of the destinies of a nation was not permitted him, which early training and habit had taught him to be the function of kings, he did not waste his energies upon a revolutionary attempt to acquire authority which in the end could not accomplish more, nor as much as has been accomplished by his intellectual superiority supported by high social position. England's greatness is the result of her insular position and of her coal-fields. Commerce and mechanical industry are the sources of British power and wealth. If there is a way by which British industry can learn something which it does not yet know, the exhibition on British soil of the industry of other nations will bring that information to her doors. If there is, on the other hand, superiority in British means and energy of which the world is not now sufficiently informed, the same means will effect favorable results. And finally, such an exhibition must benefit all nations which participate in it as well as England; and its immediate result must be an encouragement of trade, in which, by the nature of things, England will again enjoy her due share. As far back as we are informed by history, nations and governments have wasted their strength and energies, the substance and blood of the citizen, in wars which form the contents of its pages and claim our attention and admiration,—the cause or object of which was nothing more than certain advantages of trade, the acquisition of a port or a province which promised resources of wealth in some form. The Russian policy of the last three centuries may serve as an illustration in point. The first exhibition of the industry of all nations, as originated by Prince Albert, resulted in greater benefits to

the British nation than did the most successful and famous wars.

What is here presented as a synopsis of the idea which underlies the project of the Industrial Exhibition of 1851, is doubtless voluminously expressed in the transactions of that enterprise, and has been detailed in printed works innumerable. It is possessed of a political and social interest which has been, and may hereafter be, rendered in art, such as paintings, sculpture, music, and poetry. An architectural monument to Prince Albert, considered in the light of the present day, should contemplate a structure, of moderate dimensions perhaps, but yet a structure accessible and roomy enough to contain, say, in two or more cells, the historical and artistic matter now accumulated or hereafter to be contributed to the illustration of the idea of an exhibition of universal industry, which may be seen and examined by visitors, and furnish direct information as to the work done by the person commemorated. The Industrial Exhibition has here been singled out as a phase in the life of Prince Albert suitable for commemoration; but it is by no means the only act of his life deserving of it. An endless number of social organizations contemplating human advancement, owe to him gratitude for guidance and practical support; not to mention the high standard of his personal moral conduct, and an exemplary family relation, which may well serve as a model to kings and citizens. All this and more, which needs no mention here, but which goes to make up the biographical history of Prince Albert, will contribute material which should find a fitting place in such a monument. Then there is the art celebration of other persons who have been

intimately connected with his enterprises, and who have given direction by their personal influence to his thoughts and acts; they also must be included in the possibilities of such a monument. If we now proceed to model a monument to commemorate Prince Albert, we may devise three single cells of nearly equal value as to magnitude, which shall contain, respectively, first, all literary matter connected with the first Universal Exhibition of Industry; second, all historical matter connected with his life and the lives of others associated with him in useful enterprises; and, third, all art matter, such as bas-reliefs, paintings, engravings, etc., etc., pertaining to both. These three cells may be ranged on three sides of a greater central cell, which may be the Walhalla of the monument, containing statues, busts, etc., of the hero of the monument and his associates, and mural bas-reliefs of allegorical allusion to his history. It is not necessary here to enter upon an exact description of the further arrangement of the needed entrance hall and vestibules, the offices for the management and service connected with the monument; for enough has been said to show that a structural treatment would not only reveal the exact nature of the monument, but would furnish to a visitor the material out of which a perfect and complete history of the man commemorated, and of his works, could be readily formed.

There was a time once when men attested documents with a device imprinted in wax, with the hilt of their sword or a signet ring. But the time of seals has gone by, because men have learned to write their names. There is no reason why the monumental stone, with its hieroglyphic inscriptions and allegorical stat-

ues, should not yield to an organized structural monument, which, as a library and art museum combined, contains such positive information as the progress of the age is capable of furnishing to posterity. Nor can we doubt for a moment that the interior of a structure arranged to express its use, function, contents, and human occupants, and an exterior arising from its grouping, will convey a more vivid expression of the idea which called it into being, or of the person it is intended to commemorate, than the mere monumental stone of the past and the present.

CHAPTER XIX.

FORM AND CONSTRUCTION.

Architectural construction teaches the application of well-known mathematical reasoning to questions arising in statical mechanics. It deals primarily with the laws which determine the just proportions of matter under a given relation, and with the use of certain given materials; and, secondly, it investigates possible forms or possible relations of material, as also the application of mechanical laws to all available materials for all possible purposes. In this manner methods of construction are multiplied, and new materials are brought into use. Methods of construction are geometrical demonstrations in matter of mechanical ideas, and are for that reason not works of fine art. Fine art means representation and not demonstration. The author of a demonstration of an idea is, therefore, not an artist,—but inasmuch as the work produced by him is to the uninformed mind often a satisfactory representation of an idea, without becoming absolutely a demonstration (which can be the case only when the construction is mathematically understood), the effect upon the subject is very much akin to that of a work of fine art in this, that it produces surprise, or, as it is commonly called, a pleasurable emotion.

Surprise is enhanced in the degree in which the

construction excels as a scientific achievement, and also in the degree in which the essence of the argument involved is sufficiently revealed to betray, not the scheme itself, but its fitness for the purpose.

Methods of construction also appeal to the imagination, and compel admiration for boldness of conception, daring, and enterprise. Hence it follows that superior or inferior methods are applied to monumental structures in the degree in which these monuments rank in the scale of ideas represented by them.

It needs no special argument to show that form is the result of construction, and that construction determines the elements of form. Form and construction are indeed so intimately related that they may be advantageously connected in the same chapter, and that we may, as it were, step from one to the other, and gain thereby in the understanding of both.

It is rarely the case that one and the same structure represents more than one idea; but inasmuch as fine art deals with acts and emotions (phases of an idea), we can point to but few modern monuments which do not involve the consideration of a number of acts and emotions; and it needs to be considered what elements of form and construction may be used to serve the architect in expressing them. To illustrate: the Greek temple contemplates the idea *religion*, also a *habitation* for its services, a receptacle of the god, accessible only to a priest, whose act, whatever it may be, forms no element in the structure, as this act is not observed by any one. No congregation is admitted inside the temple. So far as the people are concerned this temple is the habitation of a statue without function or motion; and it follows that this purpose may

be represented by a single cell which needs expression only on the outside. A Christian church, on the other hand, admits into its interior the whole congregation, and accommodates various groups as they range themselves for prayer, private and congregational, music, confession, baptism, the communion, processions, and sermons. The service and government of the church also demand vestry-rooms, a chapter-house, corridors, and cloisters ; and thus a church structure may be termed a group of cells. In this case, as in many others, cells need not be separated from each other by walls, but may be indicated by colonnades, screens, or archways, for the reason that the separation does not arise from a physical necessity but from an æsthetic necessity which demands a representation of the separate acts which illustrate the idea in the organism of the group; and also for the purpose of distinguishing special acts by giving greater height to the cells devoted to them, and a more refined treatment in modelling and decoration.

It frequently occurs that the architect is called upon to join two or more groups, as is the case, for instance, in parliamentary structures. Such a combination of groups becomes a pile, wherein the groups are separated sufficiently to prevent practical inconvenience, and mainly to give an expression to the whole, which will tell the story of the functions of each group, and hence of the whole pile.

A series of single cells, co-ordinate in their import and use, may be treated as divisions of one great single cell, as, for instance, the rooms of a hospital, prison-cells, warehouse divisions, clerks' rooms attached to one and the same department, committee-rooms, etc. If in such

a hive it becomes necessary to distinguish one or more special cells, it may be done by simply accentuating and grouping their openings as well as by distinguishing them from others in magnitude, special modelling, and decoration. This may be done, say in a warehouse where the proprietor's office occupies an appreciable part of the building; or in the case of a physician's room in a hospital, etc. But in structures of a monumental character it should be the care of the architect to see that the representation of no separate purpose of the structure be omitted, for all features of it, if justly treated, contribute to its expression.

It is the function of the architect, in the first place, to master the idea to be expressed, to understand the various methods used to illustrate it by acts, and to appreciate the import of the resulting emotions, that he may be able to designate the various human groups which form the basis of his design.

It is often the case that the proprietors of buildings, or managers of building enterprises, commissioners, committees, or other persons do not understand the relation between the idea and the structure, or the meaning of the structure as a work of fine art. In that case the architect must supply the defect and point out these relationships; he must, if need be, awaken a sufficient interest to supplant the prevailing prejudice that a structure is merely intended as a convenient shelter for its occupants.

The next step is to determine the magnitude and form of the single cells and their relative positions, the modelling, as it were, of the group. This process is impossible either as a problem for the imagination, or as a fact to be reduced to drawing, without a thorough

knowledge of methods of construction and of the principles which govern these methods. We cannot think of spaces merely; we must think of them as surrounded by matter. This matter is called into use, and its mass is determined by laws of mechanical construction. Now it is not true that a structure (a monumental structure) is, first of all, a shelter, a place for human convenience, and afterward an object of fine art—that the domain of architecture begins when the engineer and builder have done their work of planning. It will be too late then. Architectural art must, as we have seen, initiate the work and take hold of it at the very beginning.

Why is it, then, that a different view of the functions of construction and architectural art is entertained by a large majority of modern architects? An examination of this may help us to a better understanding of the true relations of construction to architecture as a fine art. Many architects believe that every structure is a single cell, the outer form of which has no special relation to its interior. Architects love to modify this single cell in its outline, especially if it be of a respectable magnitude; but these very modifications amount only to arbitrary projections which are not the result of a relation of parts. In addition to this they view a structure as consisting of three parts—an exterior and an interior (which need artistic consideration), and the construction proper, which is placed between the two, and which needs no artistic treatment. This construction is to be overlaid on both sides with forms which please the fancy of their author. These forms do not involve mechanical ideas, inasmuch as they may be affixed to, or supported by, the real construction. Can this be architecture?

No. If construction were the vulgar thing it is said to be, the work of the mere builder or engineer; if this construction were not an integral part or motive in the æsthetic development of a monument, and if it were not possible so to modify this vulgar thing as to make it an art work, why then, surely, it would be well to conceal it from sight with something that is recognized as a work of fine art, say with hangings, screens, and paintings, with anything that is capable of expressing an idea in matter, and which is not itself a mechanical construction. But what is really done is this: the real construction is covered with a false construction which is not applicable here, or with an impossible construction not borrowed from anything real, but purely the result of architectural aberration, a thing which, if really built of stone or wood or any material capable of doing mechanical work, would fall to pieces by reason of its own weight, but which the ingenious artist persuades to stay in its place by making it of plaster, zinc, cast-iron, or something else in imitation of stone, or wood, and sustaining it by means of nails and bolts.

Now, why do architects do this? Obviously because they prefer this sham construction to the real construction; they like its form better. Then the question arises, Why not use the construction they prefer, and discard the one really employed? The reason why this is not done is that they have lost the art of architecture, the art of building. The forms they affect are not regarded by them as constructions at all, but as an aggregation of pretty things derived from interesting antique and mediæval monuments, where they have a charming effect.

The Greeks covered the walls of their temples at

the top with a liberal stone which reached over far beyond the outside of these walls, and protected them from the weather. The modelling of these cornices from the beginning of the architrave to the corona shows a movement everywhere constructively exquisite and expressive of the function of protection which this member afforded to the walls beneath. Let us see how Mr. Fergusson, an ardent admirer of antique work, contemplates these mouldings. He tells us that "the first and most obvious of these (carved ornaments) are mere mouldings, known to architects as scotias, cavettos, ogees, toruses, rolls, etc.—curves which, used in various proportions either horizontally or vertically, produce, when artistically combined, the most pleasing effect."

To him evidently these mouldings are not a modification of matter in order to express parts of a structure, or to emphasize their function, but they are things of no meaning which may be artistically arranged, and thus produce a pleasing effect. What a pity that Mr. Fergusson gives no definition of this "effect," nor explains in some comprehensive manner how these ogees and toruses may be artistically combined!

The first and foremost element of art expression in architecture is to be attained in the form of its masses. This form is not accepted as the result of mechanical relations, but of certain laws of proportion otherwise determined. Stability, massiveness, strength, elegance, and repose—all of them qualities which in a greater or less degree must exist in every monument—are clearly expressions of a statical condition of matter of which the mechanical relation is a constant function;

and yet proportion in architecture is supposed not to refer to those laws, nor, in fact, to any real law whatever.

If structural masses could be piled up without reference to the mechanical laws of construction, and yet without risk of danger to the stability of the monument, a relation of masses which gives the expression of stability would still remain a desideratum. Architecture as a fine art deals most prominently with this very expression. Should we then seek it in the laws of mechanics or in the magical numbers of so-called proportions? What man has invented a system of proportion in masses that perform mechanical functions more just or better adapted to the purpose than that which is dictated by a law of nature? Where are we to find him? Has he written a book on the subject? Mr. Fergusson gives us some hints. Let us see if we can understand them and make use of them in following this path of art without the guidance of nature. He says: "Construction has been shown to be the chief aim and object of the engineer; with him it is all in all, and to construct scientifically, and at the same time economically, is the beginning and end of his endeavors. It is far otherwise with the architect. Construction ought to be his handmaid, useful to assist him in carrying out his design, but never his mistress, controlling him in that which he would otherwise think expedient. An architect ought always to allow himself such a margin of strength that he may disregard and play with his construction; and in nine cases out of ten the money spent in obtaining this solidity will be more effective architecturally than twice the amount expended on ornament, however elegant and appropriate that may be."

The advice here offered to the architect, "that construction ought to be his handmaid," "useful to assist him in carrying out his design," clearly explains it to be the author's opinion that a contemplated design has existence outside and independent of construction; that this design represents a monument possessed of the qualities of massiveness, strength, elegance, and repose, which qualities are not derived from any law that determines these mechanical conditions, but from some other source. The nature of this source is explained in the following sentence: "That the architect should do what 'seems to him expedient,'" and not what the poor vulgar engineer finds to be scientifically just. Can it be expedient at any time to change that which is dictated by a law of nature? But then we are to make our masses much larger than they would be if we were governed solely by the dictates of sound mechanical construction? This is wise, no doubt. A monument cannot well be made too strong, nor very often too massive. But we are not to permit posterity to be benefited by this massiveness; we are to "play" with it, to reduce it here, and increase it there, in "disregard" of the laws of construction, to gain what? This Mr. Fergusson omits to tell us; but it cannot be doubted that he intends in some way to improve the relation of these masses. Can this be done? This is a very serious question, and no one has, as yet, answered it; for in no phase of architectural art which is now universally recognized as true art, has this been attempted; quite the contrary. In all good architectural work we find a strict adherence to mechanical laws, which is the more surprising, because we understand the theory of these laws so much more clearly than did the archi-

tects who produced those works. We may be sure that they did not play with this matter, whatever they did. We must give them credit for a zealous regard for construction, and for untiring efforts to make construction the prime element of art. They may not have always expressed ideas which we admire, or are willing to adopt; but the ideas which they believed in they expressed faithfully and well. Construction, the most perfect and the boldest, the most refined methods of dealing with matter, were the principal element of their art work. And when we go back to the temples of Egypt, to Karnac, where one half of the area of an architectural monument is devoted to walls and columns, we still find no disregard of construction, no attempt to play with masses for fantastic and imaginary purposes, for lights, shadows, sentiment, and effects, which are so much talked about in our day, but which have, as yet, yielded no results worthy of being embalmed in *too much* of nature's stone, nor in *too much* of human labor.

In pursuing further Mr. Fergusson's remarks on the subject of construction, we learn that "the Egyptians and the Greeks were so convinced of this principle" (of allowing a margin of strength to be played with) "that they never used other constructive expedients than the perpendicular wall or prop, supporting a horizontal beam; and half the satisfactory effect of their buildings arises from their adhering to this simple though expensive mode of construction. They were perfectly acquainted with the use of the arch and its properties; but they knew that its employment would introduce complexity and confusion into their designs, and therefore they wisely rejected it. Even to the

present day the Hindoos refuse to use the arch, though it has long been employed in their country by the Mohammedans. As they quaintly express it, 'The arch never sleeps;' and it is true that by its thrust and pressure it is always tending to tear a building to pieces in spite of all counterpoises. Whenever the smallest damage is done, it hastens the ruin of a building, which, if more simply constructed, might last for ages."

If the system of piers and lintels is pronounced a superior construction to that of the arch, on the ground of its superior stability, that system must for the same reason yield the palm to the solid pyramid; and progress in architecture can only be attained by retrogression.

At the bottom of all this we may see a misconception of the laws of construction. All matter is subject to gravitation, and every organism in consequence deteriorates with time. Whether this time shall be short or long, depends not upon the magnitude of the masses employed so much as upon their relation. It depends upon this; whether the relation is in accordance with the principles involved in the construction adopted or not.

To say that the Egyptians and Greeks knew the arch system of vaulting as we find it in mediæval cathedrals, or as the arching of spaces may be done in the light of modern mechanics, is probably not what the author of the "History of Architecture in all Countries" intended to convey. He probably refers merely to the arch over an opening in the field of a wall. That the arch never sleeps only means that all matter is possessed of the property of gravitation, the law of which is not as universally understood in the

case of the resultant lateral pressure of the arch and its order of equilibrium as the more simple law of the pressure of the lintel. We cannot advance the process of expressing an idea in a monument, either by resorting exclusively to primitive methods of construction or by ignoring its laws in trifling with structural masses to suit our fancy. All known constructions, from the simplest to the most refined or complicated, should be brought into requisition by the architect as a means to express corresponding ideas, simple or complicated, materialistic or refined. It is perfectly consistent with the stability of a monument to employ a system of vaulting, provided its lines and abutments are mechanically considered and arranged. Such a structure can be made fully as stable as a mere pile of stones in a pyramid.

When a group of cells is projected in a ground plan, and the altitude of the cells determined with due regard to their individual importance, the various roofs outlined, and the openings for light are arranged, as to size and position, with reference to practically lighting and æsthetically illuminating the interior; if the structure is composed in accordance with mechanical principle, and a perspective view of such a composition painted on canvas in black against a light background, it will fairly represent the masses in the rough, and will effectually express the nature of the structure, and the accruing forms will be æsthetically correct. Such a picture is, as far as a drawing on a reduced scale can be made to be, a representation of the phonetic expression of the contemplated monument. No additional expression can be attained by modelling, by carved and color decoration, or the introduction of statuary. All these only serve to accentuate, or to heighten

the expression inherent in the structural masses, but not to add to it. If this picture seems still lacking in expression the artist must look for the probable defects, first, in a misapprehension of the idea; second, of the acts illustrating the idea; and, third, of the groups prompted by the emotions arising from the acts; fourth, in the absence of a just arrangement of the cells in relation to each other; and, finally, in bad or feeble construction. The latter may be bad because, first, the author of the design does not understand the principles involved; or, second, he may understand those principles, and fail to apply them; or, third, he may not be familiar with known methods of construction, or capable of devising methods to suit the case; or, fourth, because the order of elegance of constructive methods does not correspond with the importance of the individual cells.

It would be of no use to retouch an unsuccessful group of this kind without due reasoning, merely in accordance with personal feeling, or in accordance with forms which at some time have made a favorable impression upon us; nor to pile on additional features that have no foundation in fact; nor to strike out those that have this foundation in fact; nor to make the whole larger or smaller. It will not help us to add favorable surroundings which do not exist; nor to fret and fume over it and wipe it all out, in order to substitute something else which foggily exists in our brain; nor to rush to a collection of books and photographs to look for better things, unless it be for the purpose of examining them critically in their individual relation, and to find by that means where, in our composition, we have failed either to do that which is true and just,

or to achieve an expression as truthful and brilliant as may seem desirable under the circumstances.

If you find that your dining hall bears no proper relation to your library, and upon examination you are convinced that it is not your fault, but that your client either studies or eats too much, let it be so. The structure must express the *morale* of your client, not yours.

But above all things do not search for special effects. Do not expand a plain country house into a palace, nor squeeze it into a cottage, nor into any known or given shape, because you admire that shape more than others. Do not add battlements when there is no opportunity to walk behind them, because you think this a fine mediæval feature. Do not build a buttress because you think you would like to have a mass in this place and a shadow next to it. Do not sketch balconies where the orientation of the structure or the surrounding landscape does not warrant such a feature; nor bay-windows, nor porticos, nor any other appendage of this nature, unless they are needed, not merely physically but æsthetically; that is, unless the going out upon such balconies, or the entering into bay-windows affords a mental entertainment which cannot otherwise be reached, or at least so fully enjoyed.

But if, after close scrutiny and correction for good æsthetic reasons, the groups or the pile fail to please you, what then? Consider that this may be owing to the fact that you are not familiar with the forms which result from your idea and its phases. The forms you know and love represent other ideas than those you are endeavoring to treat; and you may be sure if you

have otherwise committed no error of judgment, you are on the road to a good architectural result. Proceed with your work, model the parts, decorate them in accordance with their functions, and before long the thing will speak to you in a new language expressing new thoughts; it will speak to you intelligibly, and with surprising force, and you will admit that this is by far the best arrangement of forms, *better* than you could have imagined them in your most enthusiastic moods.

The question may now be asked, Which of the many scientific constructions is the architect to select for use in his monuments? All of them. None must be rejected; none can be rejected; our *repertoire* is small enough as it is. But the Egyptians and the Greeks did not make use of the arch, and the Normans did not use the pointed arch. The Egyptians, the Greeks, and the Normans did perfectly right in not doing what they did not know of. You can have no such motive. You know the arch in all the forms in which it has been used, and in forms in which it has not been used, as yet, to any extent; you know a catenary arch, an arch which is purely a curve of pressures; use it, use them all, not indiscriminately, not unwisely, but, as they are all at your command, use each of them whenever it is the best thing to be used.

What is sad to see is a flat ceiling divided into impossible panels, supported by impossible girders which are not the result of any construction whatever —a ceiling which, if it were attempted to be built in stone or wood, would drop down by its own weight, but which is worked in plaster upon a framework of wood, and tied to the floor beams above.

Look at the constructions that have resulted from the modern invention of the rolled iron beam. All of these are mere attempts to cover this unfortunate beam (one of the cleverest expedients of the age), and none to make the beam itself presentable, to arrange the arches between the beams in a logical manner that they may be sightly, and an æsthetical element.

Look at the treatment of cast-iron columns and other structural parts made possible by modern use of metals. They are more or less imitations of stone and wood constructions; but few of them devised by architects are modellings which can possibly result from the nature of the metal, yet the engineer has developed pure metallic forms unknown before, simply because he derives his wisdom from the laws of mechanics. But how can we preserve purity of style in architecture if we are to use and to exhibit constructions which find no place in the style we are working in. This subject of style we must reserve for a separate chapter, of which it is well worthy. But we may ask here, did the architects of the Norman or Gothic school neglect constructive elements because they interfered with the style of the day or of their past? If this had been so, we should be still engaged in building pyramids. The elements of the architectural results of any time are construction (in its methods and perfection), materials, fundamental ideas, mechanical and artistic skill in their development. Of all these the progress of construction has exercised the most potent influence upon past development of architecture. This is true of the state of architecture in Europe up to the fourteenth century, but not since.

A post, column, or strut of stone or wood, meaning a part of a structure which is subject to a negative strain (compression) is strongest (the transverse area being the same) if it is circular in ground plan. Although this fact is not generally known to laymen, or thought of much by architects, it happens that when we see a post or pier which has a circular or octagon ground plan, it seems to us stronger than a square pier containing the same area and length.*

From this there is but a short step to the impression that round piers or columns look strong. Hence it is that the jamb of an opening seems more rigid if we chamfer its corners. This is actually done, not only in the case of door and window jambs and posts, but also at the intrados of arches and ribs, in fact, in all parts of structure which are subject to compression. More frequently the reduction is accomplished by modelling the corners in a manner which still more heightens this effect by imparting to it an expression of strength and elegance as well as of rigidity. The transition of piers to their bases and capitals, the underside of projecting corbels, sill courses, and cornices are all treated in a similar manner. The Greeks were familiar with this process, and practised it in modelling their columns and cornices, but did not extend it to the jambs of their doorways.

The purpose of modelling masses in architectural work is to make the functions performed more apparent, and to heighten the expression of rigidity in the direction in which the forces are acting; also, in some

* The experiment is easily tried by comparing a square and round post of equal length and area; the diameter of the square post will be proportional to the diameter of the round post as 1.7 is to 2.

cases, to multiply the apparent surface of the matter treated. When surfaces are moulded, light and shade are the natural result; but light and shade are not the object of the process, they are merely an incident.

When two or three modelled groups of a structure succeed each other perpendicularly, the organization of the lower part must be more simple than the one immediately above it, and there should be a relation of mass between the parts whereby they continue each other. The lower pier, may, however, be a simple shaft, unless the organism immediately above it is so highly organized as to produce a contrast which would make the inferior organism rude, or the superior one weak or meagre. This process of subdividing masses by modelling was undoubtedly carried to excess in late mediæval work. This is evidently owing to an erroneous tendency to attenuate matter for the purpose of giving a sublime spiritual expression to the work, which well accords with the ideas of Christianity of the times, as well as to express function minutely. The times have changed, and with the times our ideas have changed; we do not now look upon matter as the despicable thing it was then held to be. This is no reason, however, why we should reject the scheme of Gothic architecture, as it is vulgarly termed, or Christian architecture, as Kugler properly calls it. The architecture of the mediæval cathedrals, considered as a system, especially when we contemplate it in its principles rather than in its completed forms, may, without fear, be accepted as the most perfect development of architectural art known to us, and may well serve as a proper starting-point for future efforts,—always provided that we confine ourselves to the prin-

ciples manifested in it, and not to its forms; and that we apply these principles to create such forms as will express our own ideas, and not those of the middle ages.

The analysis of the human body is the work of the anatomist, but to depict human emotions in stone or on canvas is the work of the artist. He deals with the material motions of the human figure, and must, therefore, understand its anatomy. More than this, the human frame is created to the artist's hands, and we may presume that nature has adopted the most brilliant construction which could be devised to combine expression with function. It is the problem of the architect to depict the emotions of the structure he deals with; to depict, as it were, the soul of that structure. But the emotions of this soul, like the emotions of any soul, can be depicted only by representing modifications of the body under the influence of emotions; and for that purpose the architect must understand the anatomy of his structure, which amounts to an analytical knowledge of its construction. More than this, the architect's structure, unlike the painter's or the sculptor's, is, in the first place, necessarily a human creation; not a natural organism which contains within itself a perfect system of mechanical construction, not only the best to perform the functions assigned to it, but also the best to give expression to those functions, to the end that man may, if not understand, at least know them without a scientific analysis. Thus the architect must create his structure (while the sculptor and painter only re-create) upon principles supplied him by nature, which are the principles of mechanics. It is necessary,

moreover, that his construction should perform not only certain physical functions, but also others superadded to these, which may be termed ideal functions, and which pertain solely to the ideas which have called together the persons occupying the structure; and, finally, this construction must be capable of an expression which conveys the idea of the motive for the existence of the monument.

This knowledge of mechanical construction should be also sufficiently positive to furnish the architect, at every stage of the composition, with a clear view of the mechanical relation of the parts of the structure as he develops them, that he may at all times in the production of an organism, and afterwards, in the external modelling of its parts, justly express its functions.

Carved ornament and color decoration have no other purpose than to heighten the expression of mechanical resistance to load and pressure in architectural organisms. They do this (as will be hereafter more minutely shown) by their density, magnitude, projection, form, and the direction in which they are placed, which direction must coincide with the direction of resistance to load and pressure. They do it also by the peculiar treatment known as conventionalizing ornament, by which natural forms of animals and vegetables are so modified as to conform to the nature of the material in which they are wrought, and to the mechanical work which they perform.

The motives which influence modern architects in composing a design, and the quality of mind which enables them to compose, may be summed up as personal notions of the proper character of the structure, and of the effect which it may produce upon themselves and

others; all of which is matter of *taste*. This taste some admit to need cultivation, and this cultivation is exclusively sought in the contemplation of the architectural work of the past, which is not applicable to the needs of the present, and which tends to fill the imagination of the zealous student with pictures which it would be better he should not know, if he is not to analyze them intelligently; for the greatest and first lesson which they teach is how not to do it.

The motive which governs the modern architect in composing a monument may be stated as a desire to please the public, or, as he says, produce a favorable effect. The education of the architect consists in looking at architectural forms which have produced favorable effects upon others. Such a course of education cannot certainly be productive of new forms or of a proper use of old forms. In truth a proper art use of old forms under new conditions is a practical impossibility. To illustrate: a painter who depicts the warrior paints him in mediæval armor; he thinks a knight in armor exceedingly picturesque. The word picturesque with him embodies all that is good and proper in the way of dress, accoutrement, and physical development responding to a system of attack and defence carried on with certain given weapons and with an armor devised to resist these weapons. If you visit the studio of this artist you will find there swords, foils, breastplates, helmets, spears, and chain-armor—in fine, every contrivance of offence and defence known in the Middle Ages. The artist has lived among these objects so long that he is able to draw them on paper or paint them on canvas in every conceivable combination consistent with their use. What is more, he has acquired a love

for these forms, and he deems them eminently beautiful. Now let us imagine that a patron of this painter demands a picture of a warrior which shall not be a mediæval knight, nor a Roman, or Greek, or modern soldier, but purely an ideal invention. Could the artist invent the figure of a warrior by merely trying to sketch and paint one? Certainly not. He could produce nothing but Greek, Roman, mediæval, and modern warriors, or imperfect and incongruous combinations of all of these. Is the thing impossible? No, it is not impossible; but the process demands a species of skill not possessed by the artist. In the first place, a series of weapons would have to be devised upon principles heretofore not applied, and then an armor to resist these weapons. All this may be theoretically done by some person versed in possible methods of war, revised and corrected by an able military engineer, practically executed by a skillful armorer, and then the painter could paint a picture of an ideal warrior which would rank in beauty with pictures of the warriors of the past. If architecture is to be equally successful, the architect must combine with his art other technical skill corresponding to that of the general, the military engineer, and the armorer, and which in his case amounts simply to a thorough knowledge of the theory and practice of mechanical construction.

Relations of matter cannot be clearly understood nor successfully reasoned upon unless they are numerically considered. To say that the earth moves around the sun, conveys an idea; but it is a very confused idea, which cannot be made positive until we know that it completes a revolution around the sun in one year, and that the mean radius of its orbit is ninety-

two millions of miles long. Now, when we say that this latter statement gives us a positive idea of the motion of the earth in its orbit, it is not meant to be an assertion that we can form in our minds a picture of that orbit or of the velocity of the motion of the earth; but that we can proceed to reason from these data with certainty, and arrive at the final conclusion that the earth moves in its orbit around the sun during a second of time over a space nearly 18.5 miles in length. It is true that a velocity of 18.5 miles per second is as much an enigma to the human mind as ninety-two millions of miles measured out in space; but with the help of the figures presented to us we can proceed to reason from one step to another without fear of error; in fact, with the certainty that every conclusion arrived at will be numerically correct.

Now architecture is the art of representing ideas by masses of matter. We can gauge these masses, we can mathematically determine their dimensions under certain conditions of work to be performed by them, and also under certain conditions of apparent energy in resisting a given load.

Shall we abandon this opportunity to reason numerically? If we do so, we relinquish the only method of reasoning which never fails, and we must drift into a shoreless sea of architectural aberration.

CHAPTER XX.

PROPORTION.

The relation of the parts of a structure as expressed in magnitude (extension, mass,) is called the proportion of a monument. It means: given a temple of a certain length, what is to be its breadth and height, and what the respective dimensions of its columns, bases, capitals, entablature, etc., in order to respond to the laws of beauty? This is the popular way of stating it, and there is a decided infelicity in it, because the laws of beauty are unwritten laws; they are not laws either demonstrated or tested in the same way as judicial, scientific, or moral laws, before they are recognized as valid.

The process by which these laws have originated is this: Whenever it is asserted by a leading architectural authority that a monument excels in the quality which is designated as beauty, it is assumed that all elements of beauty must be attributes of that monument. Proportion being one of these elements, the monument is said to be a model of proportion, and its proportions are recommended for use in other monuments erected in the same style. Hence we have as many schedules of proportion as there are styles, and all of them are respected as correct. The tribunal which determines that these proportions are good is

the same as that which pronounces upon the general characteristic of beauty—it is known as taste. Hence it is that Renaissance architects believe exclusively in Greek and Roman proportions as the true standard of proportion in architecture. They do not absolutely deny that mediæval monuments possess beauty, but they deem it a peculiar beauty devoid of good proportions. In the same manner a certain beauty is granted to Egyptian monuments, though the proportions of their structural elements are pronounced to be curious. Mediæval architects, again, prefer Gothic proportions, but do not deny antique beauty.

The only theory by which the judgment of the leading minds of the various schools can be shown to be consistent is, that when beauty is spoken of they mean expression as well. The Renaissance school says: I admire the expression of Greek and Roman monuments; I also admire as beauty the mental effort of those who have successfully produced this special expression. I cordially approve the relations of matter, the proportions of parts, as I find them in these antique monuments; they are to my mind the exact proportions that should be employed in producing the expression which I admire so much. When I contemplate a mediæval monument, I am displeased with its expression; if, however, it is the problem to produce just this sort of expression, which is possible, though inconsistent with good taste (my taste), then the problem has been solved with success, and I may recognize it as an art effort which results in beauty. I do not admire the proportions of matter employed, because they do not lead to an architectural expression which is acceptable to me. Considered in this light

there is nothing inconsistent in the argument; it proves that one of the conditions of the proportions desirable in a monument must be the ultimate expression aimed at. We are also enlightened upon another point, viz.: That taste is not a trustworthy standard applicable to the abstract consideration of the nature of proportions.

We may, however, approach the subject of proportion from another standpoint: we can inquire into the import of proportion in the abstract, and into the elements which exercise an influence upon it.

The term proportion, relating to the masses of structural parts, may be considered independently of the properties of strength and elegance. A structure may be weak and inelegant, and yet may be possessed of good proportions; that is, it may be consistently, proportionately feeble or inelegant throughout. This means that no element of the organism fully performs its functions, and that all the elements fall short of doing so in the same degree. Or the reverse may be the case: every element of an organism may abundantly perform its proper functions; and if this abundance in excess of the needful masses which would be sufficient to do the work well is not greater in one element than in another, then this organism may be said also to be possessed of good proportions.

The function of the architect in expressing an idea in matter is to determine the degree of strength and elegance which should be the attribute of a given monument; therefore, as soon as the masses necessary to meet the mechanical laws of construction are arrived at, he may direct how much stronger the whole or a part of a structure shall be made. He may say I will make

this ten, twenty, thirty, fifty per cent. stronger than need be, in order to attain the expression of stability, vigor, or elegance which will accord with the dignity of the idea to be expressed. To estimate the scope of this process of increasing the masses in order to attain apparent stability corresponding in degree with the nature of the monument, it should be remembered that a great part of this work is accomplished in the selection of methods of construction, which by their simplicity, boldness, elegance, or vigor convey the desired expression before the time when additions of mass are in order, and also that in the subsequent process of modelling of the masses much more is to be done in the same direction. The small quantity which needs in fact to be added to the mass of a structure to make it æsthetically effective, it will be found, upon close examination, must be added *pro rata;* or, in other words, the safe load which our material is to sustain must be reduced according to a certain standard, and this reduction constitutes the intended addition.*

There are no doubt cases where the mass of isolated elements must be exceptionally increased, as, for instance, where in one and the same structure different materials are employed which resist pressure or tension unequally, and where this inequality of strength is not expressed by the texture and color of the material with sufficient emphasis to convey promptly the idea of su-

* This safe load is a certain fractional part of the load which can be imposed upon the material within its limits of elasticity; and the more we reduce this fractional part, or the more we increase the divisor of this fraction, the greater will be the stability of the structure composed under this rule. But this law does not tend to an increase of matter in an arithmetical ratio, but in various ratios which result from the nature of strains.

perior resistance to force; for instance, when in a structure of sandstone or of brick, a granite pier or column is introduced which will sustain a load three times as great as would be sustained by a pier of sandstone of the same size, this granite pier or column cannot be reduced absolutely to the sectional area which would technically answer the purpose without creating a discord. The fact that this pier is of granite and not of sandstone is not perceived by the observer as promptly as the other fact, that it is small in proportion to its load; and it becomes the function of the architect to compensate in mass for this defect of human perception. If the pier or column is polished, the nature of the material becomes apparent more promptly; and this in itself again modifies the necessary mass. Color also has the effect of changing the apparent resistance of matter to strain, and must have its due weight in the variation of masses from that quantity which is directly determined by the laws of mechanics.

Upon the whole, however, it is these laws alone which must and will ever determine the just relation of masses, and it is this relation alone which constitutes proportion in architecture; always taking into account with the property of strength that other property of elegance, which is its complement in producing *repose*, viz., the expression of a just and perfect performance of function in relation to the idea, the ultimate attainment of æsthetical modelling of matter. To illustrate this by an example, and to show that mere feeling (taste) is not a reliable guide to correct proportion, let us imagine a wall with its superincumbent load of floors, roof, etc., supported by a series of piers; let us

assume that a man of taste has determined the diameter of these piers to be of such magnitude as to express the character of the monument perfectly, without examining mathematically the relation of these masses. They are stout enough and not too stumpy, as he would say. He has prepared a drawing of this part of a structure, and has contemplated this drawing for hours. He is now satisfied that it is exactly the thing needed. This means that he has felt his way into the obscurity of a hidden principle, with the assistance of a natural gift, by which he can determine this thing without being able to explain it. That he is quite right there can be no doubt in his mind. He has not only fully satisfied his own taste, but also that of a number of professional friends, who have seen the drawing, and have pronounced it to be possessed of charming proportions and exquisite feeling. More than this, he has called in his builder and his engineer, and they have decided that these piers are strong enough, abundantly strong, to carry their load.

These are the precise conditions under which judgment is pronounced upon proportions by at least nine-tenths of the profession. The thing looks well in the drawing, and it must be right. But now for the sequel. The structure is erected and shows signs of weakness. There is nothing very serious—a slight crack in one or two of the piers, perhaps a local flaw; but the architect becomes uneasy, not because he thinks the piers insufficient in strength, but because, now that he sees them finished, they look weak to him. He consults his engineer, who measures the piers and their load in the structure, and pronounces them insufficient. How

can that be? They are built according to the drawing heretofore examined by various engineering experts, and pronounced right. Now the engineer is perplexed, he desires to see again the drawing, in order to compare it with his measurements taken at the building. The result of a brief examination is that the scale marked "one inch to the foot" should have been "one-half inch to the foot;" and he duly explains to the architect, who in his turn cannot comprehend why a thing twice as large in every direction should not express precisely the same relation of matter, since it certainly does the same proportion, as proportion is understood by the modern architect. When the dimensions of a structure are throughout multiplied by two, the loads become eight times as great, and the areas of the supporting piers only four times as great; hence the piers are in this case only half as strong in relation to the increased load as they were before the dimensions of the structure had been increased. What is true of an increase of one hundred per cent. of the dimensions of a structure is also true in case of an increase of any percentage less than one hundred. It does not follow that a structure fallaciously constructed in this manner must immediately deteriorate and show signs of decay; but it does follow that such a mechanical error leads at once to an expression of weakness, which, of all possible expressions, is æsthetically fatal to an architectural monument.

A drawing is not a trustworthy guide to proportions; its expression is at best only that of a structure of its exact size. Redraw it on a larger or smaller scale, and if your judgment of proportions (which means your superficial estimate of masses without a

scientific inquiry into the mechanical relations) is good, you will feel a desire to change the dimensions of parts of the structure whenever you change the scale of your drawing.

But this superficial judgment of proportions is always erroneous in the degree in which we deviate from the scale in which we are in the habit of drawing familiar structures, repeatedly tested by numerical examination of strains, lines of pressure, and areas of resistance. Yet many of the schools, and even academies of high repute, teach the fallacy that Greek proportions (multiples of diameters) should be applied always, which means that the relation of masses and their geometrical ratio express always the same degree of strength and stability. Let l, h, and t represent respectively the length, height, and thickness of a wall mass to be supported by a pier, the diameter of which is d; assuming that this pier is exactly sufficient to support its superincumbent load, we may say that d^2 is mechanically proportional to $l\ h\ t$ in their relation of a pier to its load, d^2 being in that case the area of that pier if it is a square pier; or representing its proportional value if it be circular or of any regular form whatever which may be inscribed in a circle. If we should double the dimensions of the mass to be supported, it would become $8\ l\ h\ t$; and if we inquire into the diameter of the pier needed to support the mass which results from doubling these dimensions we have $l\ h\ t : 8\ l\ h\ t = d^2 : x^2$ and $x = d\sqrt{8}$; which means that the diameter of the pier needed would not be double the diameter of the first pier, but 2·83 times this diameter. If, instead of increasing the dimensions of the mass to be supported, we reduce them to one-half, then the

diameter of the new pier $x = \frac{d}{\sqrt{8}} = 0{\cdot}35\ d$, or nearly one-third instead of one-half of the diameter of the former pier. This proves conclusively that if the dimensions of masses, as found in existing monuments, are increased *pro rata*, the supports become weakened; and if they are decreased, their dimensions become too great in relation to their load.

Yet such a law of proportion, viz., a constant geometrical progression of size of column and entablature, has become the fundamental article of faith with the Renaissance school; but singularly enough the taste of those who belong to that school—poor guide as it is—revolts against it. They find that on a reduced scale their orders lose in elegance; hence they carry them through two or three stories of their structures to make them look better, and thereby fail to express the most important characteristic of the organism they are endeavoring to represent æsthetically.

The Greek temple is the expression of a simple idea, and a single act illustrating it. Most modern structures are the result of a series of related acts, or perhaps a series of ideas of various values, which must be exhibited in order to tell the story of the monument; and hence such a structure cannot be clothed in the simple drapery of antiquity.

Another confused idea of proportions, prevalent among architects and laymen, is that spaces, rooms, halls, naves, aisles, etc., must, to be beautiful, be possessed of certain proportions of length, breadth, and height. The magical numbers recommended for this purpose vary with their authors, or, better still, with the persons who recommend them; the names of the

original authors are nowhere recorded, nor have they communicated to us any reason for the prescription. It may be stated as a common law of architectural art that the proper proportions of a single cell are any dimensions of length and breadth which correspond with the human groups which are to occupy it (always provided these groups are artistically arranged, which means that the groups themselves are expressive of the functions they perform); and the height of a single cell is the result, first, of the dignity of the functions performed in it; second, of a sufficient system of lighting of the space enclosed; and, third, of the relation of the cell to other surrounding cells. It is self-evident that these proportions must consequently differ in cases where the elements which govern them are known to differ. It is equally evident that the just, ness of these proportions must depend upon the reasoning powers of the architect, upon his knowledge of the uses and purposes to which this cell is to be devoted, upon his skill in expressing the various elements which constitute his rationale of the whole, so as to cause any moderately intelligent observer to see- or at least to feel, his motives at a glance.

Take for illustration a familiar example: We find billiard-rooms which are just large enough to hold a billiard-table, while affording the necessary space around it to handle a cue, and no higher than needful for the same purpose. The dimensions of such a room express perfectly the *idea* that the owner desires to combine exercise with recreation, without bestowing further thought on the subject; without, in fact, deeming the matter worthy of any effort to express a personal love for the game, or in which an exalted idea of

the way this amusement should be proffered to his friends. Let us imagine now that another person desires a billiard-room, which shall not only be large enough to permit persons to move with freedom around the table, but also to admit of a fireplace—say in the center of one of the long sides—sufficiently removed from the players not to interfere with their comfort; again, of sofas and arm-chairs for the accommodation of spectators; also, at one end of the room, of a series of cases to hold a large collection of cues, billiard-balls, maces; perhaps, also, some books on the subject of billiards and kindred games; and at the other end, two or three small tables for refreshment, for the use of the company. It is clear that this room will have entirely different proportions from the former, inasmuch as it is expressive of a different conception of the idea of amusement by means of playing billiards; and we may conceive a series of possible billiard-rooms, which shall in their appointments and expression differ essentially from either of the above models, and which will demand, consequently, different proportions of length and breadth. Then, again, light—good light—is an essential element in a billiard-room. If the room can be lighted at the two long sides, or at the two ends, or at one long side, or at one end only, in either case there must be a difference in the number of square feet of light area needed to supply the room equally well. Not to crowd windows immoderately—a thing proper in a shop, perhaps, but not in a gentleman's billiard-room—the height of these windows above the level of the table must be increased or diminished, and must thus, in a great measure, also determine the height of the room. Clearly, therefore,

even in an apartment so commonplace and simple in its idea and in the grouping of its occupants as a billiard-room, a number of elements are to be considered, which jointly determine its dimensions, or, as it is called, its proportions, all of which must be intelligently considered and æsthetically expressed, to forestall any doubt of the proportions arrived at being good proportions. When we come to courts of justice, halls of parliament, churches, reception and ball rooms, drawing-rooms, libraries, etc., the condition and ideas to be developed become more complicated, and not only must the proportions of each of these cells differ from that of others, but every special case demands its special proportions.

Certain views of Mr. Fergusson on this subject illustrate forcibly the frivolousness of modern art logic. He says: "If one hundred feet in length by fifty feet in height is a pleasing dimension for a certain design, and it is required that the building should be five hundred feet long, it is only necessary to break it into five parts and throw three back and two forward, or the contrary, and the proportion becomes as before."

What are we to think of all this? What is meant by the pleasing dimensions of a design? Is this design an existing thing outside of, and disconnected from, the structure which is to be erected; a thing existing in the brain of the author as a beautiful object which has a being, before and above the problem to be solved; a temple, perhaps, to Jupiter, or Venus, or Mars, completed and finished as to its outer shell; into which shell is to be crowded a hospital or a war department which has the merit of being fifty feet high, but the misfortune of being five hundred feet long?

The author of the "History of Architecture" seems to have turned this matter over in his mind somewhat in this wise: A hundred by fifty is a good proportion for a design which fills my imagination and fully satisfies my taste. My taste in architecture is a court of last resort; I must do one of two things or fail. I must either make this structure one hundred feet long and fifty feet high, or five hundred feet long and two hundred and fifty feet high. But neither of these proportions will satisfy the war department or the commissioners of the poor, yet I cannot sacrifice art to human perversity. I will design five structures joined together, each of which shall be a hundred feet long and fifty feet high; and in order that their separate existence shall be recognized, I will project three of them beyond a certain line, and withdraw two behind that line; or I will project two and withdraw three; either will answer this æsthetic purpose, and taste will triumph over matter.

It seems from this that the nature of the structure, its inherent cellular organization, the idea or ideas which have called it into being, have nothing at all to do with this matter of proportion, in the face of the magic numbers of fifty by a hundred, which are firmly established by human taste. What right has the war department to spread out five hundred feet in length, if it cannot afford to rise to two hundred and fifty feet in height at the same time? What claims upon art has a structure so inordinately long?

Some perverse architect, who has not the fear of taste before him, might irreverently suggest that the very length of the structure being an organic requirement, would form a marked feature which art should

utilize to explain the ideas which called the structure into being, and thus give to it expression, which, after all, is the sole object of art work. Perhaps the interior organism might be appealed to, to suggest a grouping of its parts more nearly true in art than five times one hundred, or that a repetition of five cubes of equal size does not present the promise of a harmonious chord, but rather that of a monotonous noise. But all this would be pronounced to be a want of feeling in art.

In truth, a structure five hundred feet in length, composed of the same elements, may not prove a monument of poetical expression; but the reason of this is not to be sought in a defect of proportion, but in the lack of intelligence in its author, which prevented him from discovering a just method of grouping in harmony with the various elements of thought or phases of idea contained in the monument, for which no arbitrary division can compensate.

Architecture is not the offspring of a heated brain, a jumble of forms, or an aggregation of conceits; it is a human creation in imitation of nature, which means under the government of natural laws. These alone can determine form, and forms must grow under the hand of the architect in obedience to them.

If these forms respond to their environments they will be endowed with due proportions, always provided nature's methods of creation are recognized as superior to human prejudice and conceit.

It is the opinion of many writers on architecture that effects of magnitude, depth, and perspective, as we find them in the mediæval cathedrals, are the result of premeditated effort—a sort of artistic trick to make the most of space and mass, or to give an exaggerated im-

pression of the magnitude of these monuments. This is an error: the men of the Middle Ages were much too seriously employed to seek after startling effects. Their structural elements were entirely the result of their constructional methods; they aimed at the perfection of the mechanical relations of parts, and a full, honest, and clear æsthetic presentation of all important organic elements, so as to make them speak forcibly to the mind of every man. Whenever in an organism the parts are strongly accentuated, the magnitude of the whole becomes apparent. When we see an unshapely rock, we are at a loss to form an opinion of its size, which a house, or a tree, or a man in its neighborhood will help us to understand. A series of familiar objects distributed at different heights will make our vision and judgment still more clear. Gothic architecture offers this opportunity for the comprehension of the magnitude of its monuments by a ready comparison of its structural parts, which are not too large nor too small for their individual functions; hence the relation of their masses to the mass of the monument as a whole tends to convey a correct idea of its magnitude.

CHAPTER XXI.

TREATMENT OF MASSES.—SYMMETRY.

Organisms in nature arrange themselves around an axis, or around a central point. Natural crystals or fibrous substances are almost always symmetrical, and yet again never fully so. Organisms of the same species agree in form, so as to be recognized as members of a certain family, yet they differ enough to assert a distinct individuality. This is undoubtedly owing to environment. Forms in architectural art are expressions of ideas in matter, which ideas form classes, and are possessed of individuality; therefore, to be successfully represented, these forms must be determined by environment. By this it is meant that irregularity of form in a structure is not in accordance with the law of imitation unless it is determined by environment; nor is it desirable that minute characteristics should be unnecessarily emphasized. Otherwise it must be clear that absolute symmetry cannot well extend beyond the single cell, as no two ideas or two acts illustrating the same idea are precisely the same. The transept and aisles of a cathedral are extensions of the nave, and, although separate cells, they are expressive of the same idea; hence they are symmetrical. Two chapter-houses, one on each side of a cathedral, would be an incongruity.

Not even isolated structural parts can be symmetrical if their functions are not the same in every direction, as, for instance, a pier at the transept. If two axial lines are drawn through this pier at right angles with each other, so that one of these lines runs parallel with the axis of the transept, and the other with that of the nave, which by their length represent the value of the transverse area needed to resist perpendicular pressure, it will be found that these lines will be greater when measured from the point of intersection toward the axes of the nave and transept than those running parallel with these axes. An examination will show that these piers are frequently constructed upon this principle, and so is a human leg or arm. A good deal of talk has been wasted on the symmetry of the human body, to prove that the symmetry of nature in this case should be imitated in architectural monuments, without regard to the ideas and functions of its single cells. It has been said that the human viscera are not symmetrical, and hence that the interior of a structure may consist of cells with functions unlike in purpose, character, and importance, and yet that these should be expressed symmetrically in the exterior. The human body is but a single functional organism, not a series of such organisms expressing different ideas. The parts of the human body which are structural, like the arm and leg, are necessarily symmetrical; their functions are the same, unless otherwise determined by environment. Our legs must be of equal length and equal structure and capacity to do their work. The arms of the artisan are unequally developed if his special work demands greater exertion in one arm than in the other.

The most potent argument against the tyranny of symmetry may be found in architecture itself, where the lower part of a structure is so treated as to express greater strength than the upper portions. All schools of architecture admit the propriety of this for the very good reason that the function of sustaining a greater or lesser load should be expressed. Whenever any part of a structure performs more work or different work than another, this must be expressed, whether or not a similar function is performed by any other part of the same structure.

STABILITY AND MASS.

An architectural monument is the expression of an idea in matter, to the end that the idea may endure and be conveyed to future generations. It follows, therefore, that stability is one of the principal qualities of a monument. If a monument is so constructed as to *be stable*, it will doubtless also present the appearance of stability. Stability, therefore, is not merely a question of mass, but also and mainly a question of mode of construction. This is forcibly illustrated by comparing the masses of, say St. Ouen, at Rouen, with those of the dome of St. Peter's. The former contains some 47,000 square feet of area on the ground floor, 4,600 feet of which, or nearly one-tenth of that area, is occupied by the walls and piers of that structure; while the latter, with 227,000 square feet of area, has walls and piers containing 59,000 square feet, or something more than one quarter of the space covered by it on the ground plan, which shows a relation of masses as five to two. But if we remember that

the surrounding walls of rectangular structures increase not as the areas, but as the root of the areas, it will appear that the mass of St. Peter's (the material consumed in that structure) is to the mass of St. Ouen, at Rouen, very nearly as three to one, and yet the latter has the appearance of the greater stability. This difference is owing, first, to superior construction, and next to a better architectural expression of the masses.

MATERIAL.

The most important consideration which presents itself in relation to material as an element in art work is, that it should be worked, formed, modelled, in accordance with its nature. This is not a mere economical consideration, but one which pertains in art to the law of imitation of nature. Stone and brick act in a structure by reason of gravity only, in contradistinction to wood and iron, which are used also to resist tension. In a frame of wood or iron, the perpendicular members of a truss are not expected to retain their position against the action of the various forces at work through gravity; but they are kept in position by special ties and struts which counteract these forces. Hence it is that in stone and brick construction, the solicitude of the architect is directed to the bond of the stone or brickwork. A good bond is effected by resting each stone upon two stones immediately under it, and each brick upon two bricks immediately under it; a process which is technically termed a change of bond. Now in a piece of masonry this change of bond must be expressed on the outside, and not concealed, as is frequently done. It must pervade the whole

structure, and must traverse the projecting members to show distinctly that the idea of a bonded wall has never for a moment been lost sight of; and more especially that no attempt has been made, by concealing the joints, to have the material appear larger than it is in reality; for it must be remembered that there is a peculiar æsthetic result derived from the use of large, and another from small material. The magnitude of the material is an environment to be considered and expressed. On the other hand, when the nature of the material demands the fastening of the parts by bolts and ties, as in iron and wood, it becomes necessary for each of these fastenings to be not only plainly visible, but architecturally emphasized; the modelling must command attention, in order that the abundant stability of the organisms may become apparent. No material should be so moulded as to impair its appearance of stability, or to make it necessary to use extraordinary tools, or excessive labor to work out the design; for, indeed, the object of all modelling and decoration is, and must always be, to heighten the apparent resistance of the member to the strain imposed, and not to weaken it; also, to do all this in accordance with the true nature of the material. If a stone forming a breastwork needs to be perforated, in order to give to it the lightness or elegance demanded by the function, this may be done, as long as it can be conveniently accomplished with the ordinary tools of the stone-cutter, and with an ordinary effort of labor, from either or both sides of the material; but it cannot possibly add to the expression of a monument to set up a series of turned stone balusters and unite them with dowels to a coping, or to use attenuated material in a series of columns

and arches for the same purpose. In fine, whatever cannot be accomplished by perforating the material from the face, leaving it otherwise in large pieces properly bonded, should be omitted as not in imitation of nature. The character of a well-bonded wall must never be lost sight of. It is recommended that the material used in monuments shall be large, mainly because we find exceeding large stones in Egyptian and antique monuments. There is, no doubt, a certain dignity in large monoliths; and in the case of columns upon which a great weight is concentrated, monoliths should be used if possible. The construction is thereby actually improved, and the apparent stability enhanced; but, on the other hand, modern monuments are of necessity so highly organized that no room is left for very large material. The fact that great monoliths produce a favorable impression in obelisks, pyramids, and temples, is owing to the nature of those monuments. They are primitive expressions of simple ideas, and their magnitude, and the magnitude of the material of which they are composed, are either one of a very few methods, or often the only method, of expression. The tower of Babel was intended to be big, and nothing more—a gigantic landmark, a huge finger-post. No doubt it was built of large material. The absence of mortar in Cyclopean work also made large material desirable. Modern resources of architectural expression permit us not only to dispense with this childish means of conveying an idea of magnitude and endurance, but they also so modify the arrangement and construction of our monuments, that there is no room left for this species of luxury.

Rich marbles and other rare and valuable stones

possess in their color and texture very acceptable means of composition in color, a sort of architectural mosaic which is very desirable, provided it amounts to a system that corresponds with the construction and heightens its effects. The reverse is often the case in many mediæval monuments, wherein odd and ill-assorted columns of undesirable form and of heterogeneous color are collected in the same structure, perhaps from motives of respect for this rare material, and perhaps from motives of economy because of the opportunity to procure it readily. They impart to these monuments very much the appearance of bric-a-brac museums, the character of the structures as monuments being belittled thereby.

We find, mainly in Northern Italian work, a practice of lining brickwork with marble slabs. Mr. Ruskin speaks of it with approval. He says: "These Italians did not pretend that these piers were built of precious marbles, but avowed the fact that they are merely an external lining, plainly exhibiting the iron bolts and hooks with which this lining is fastened to the brickwork." If it becomes desirable in a monument that brickwork should be lined with marble in the form of slabs (a method of construction which cannot be pronounced monumental in character, but which in special cases may be tolerated) it seems necessary that portions of the brickwork should find expression somewhere and as often as sound construction demands it, for the purpose of tying in and bonding the slabs inserted with the main structure. This would be a constructive method of using thin slabs for a facing of inferior work; it would amount to an artistic avowal of the process and could,

no doubt, by judicious treatment, be made a work of fine art. But to bolt or nail large marble slabs upon parts of a structure of rude brick, cannot possibly pass for architecture.

The great vice, however, of this century is in the effort to make inferior material answer for superior material by way of base imitation. It can hardly be necessary to speak of this here, more especially as in England, at least, the fallacy of this attempt at show has been almost universally recognized as unworthy of honest men.

A mania for iron buildings, which is now happily dying out everywhere, was merely an attempt at a spurious cast-iron imitation of modelled and carved marble, granite, or sandstone. Iron, when used as a legitimate building material for exterior walls, if properly put together in accordance with the nature of the metal, and so constructed as to afford protection from the weather equally well with stone or brick, and architecturally treated by exhibiting the leading connections, at least sufficiently to convey the idea of stability, and properly modelled and decorated, does not favorably compare in cost with either stone or brick. It would take a long time, also, before a respectable iron architecture could be developed; but as a cheap display is its sole object, and it has been demonstrated that there is no economy in it, it has been wisely abandoned. The legitimate and economical application of iron in architecture is to be found in the use of rolled iron as a substitute for wood in many constructions, such as roofs and floors. But all this is outside of the subject under consideration.

England and Germany have produced of late years

many successful efforts at brick construction; but it may be fairly questioned whether great results can be attained in this direction unless all so-called terra-cotta imitations of moulded stone are abandoned. It seems necessary that in the artistic treatment of brick architecture we must insist upon the use of brick alone, large brick or small, thick or thin, plain or decorated on the face (each brick by itself), but a brick it *must* be—always a material which can be bonded without artificial means, and laid up in the wall with such projections only as are compatible with the dimensions of the material itself. What has been said with reference to the use of marble slabs as a facing of brickwork is also applicable to the use of terra-cotta panels baked in the form of slabs, and to the exceptional use of the tile. A real visible bond should be effected, and the thin lining be visibly incorporated with the wall.

CHAPTER XXII.

CARVED ORNAMENT AND COLOR DECORATION.

Architects, art critics, and writers on æsthetics, differ greatly as to the extent to which the science of construction enters into the consideration of architecture as an art; but all agree that carved ornament and color decoration are elements in architecture. Mr. Ruskin goes so far as to say that architecture *is* decoration and sculpture, and nothing else; and he entreats architects to study sculpture and painting that they may become architects. If it were true that architecture is nothing but sculpture and painting, then Mr. Ruskin would certainly be right; but if architecture is the art of expressing an idea in a monument, then the architect must acquire a vast amount of knowledge and technical skill, which is in itself quite sufficient to consume an ordinary life-time, and precludes the possibility of sufficient leisure to make himself a master of sculpture, which is also a life problem. An architect must, however, understand the theory of carved and color decoration, for the very good reason that they are elements of expression intended to heighten the effects of construction, which alone determines form; or, in other words, they constitute color and texture, which, added to form, can do more to express function than form alone can do. It seems clear, therefore,

that carved-ornament and color decoration, to effect the object intended, must be designed by the author of the monument, the architect.

It is very singular that professional practice herein greatly differs from professional profession. There are but few architects who entirely depute construction to others, but there are not many who design their own carved ornament, and only isolated practitioners who design their own color decoration. Generally all this work is done by independent artists nominally subject to the supervision of the architect. Practically, however, this supervision is only extended over the modelling of the carved ornament in the questionable form of a veto power—a power to reject what is not in accord with architectural taste, and not a power which assumes the initiative by directing through specific drawings exactly what is to be carved in certain places.

There is to be found in every hand-book of architecture a discussion on carved ornament and color decoration, which generally concerns itself with these questions: How much carved ornament may we use in a building? and, is it well to decorate the outside of structures in color? These questions are answered very ingeniously by one eminent writer, who says, you cannot have too much ornament as long as the ornament you propose is really ornament; and by another that the Greeks undoubtedly painted their temples on the outside (which it would be architectural sin to disapprove), but that it is very doubtful whether they would have done so had they built them in England where the atmosphere is not clear. Whether this is good logic or not, it will not help us to a clear understanding of the function of carved ornament and

color decoration in architecture, and we must share the misgivings of some, that it is not good logic.

The result of a mathematical consideration of the relations of matter in an architectural organism is a determination of the dimensions of parts and of their configuration. This is essentially *form*. The study of a series of geometrical drawings of these forms, and a mechanical analysis of the same, answers the important question, whether or not these forms are adequate to express the needed degree of strength and elegance which are demanded by the ideas to be architecturally expressed in matter. Architecture, however, requires that the monument shall speak to those who are not capable of analyzing mechanical relations; and, more than this, the effect aimed at is one which must act with greater promptness than a process of analysis would permit. We, therefore, resort to all available means to give expression to the matter composing monuments. Now the structural form of the material used serves this purpose admirably; and it becomes the aim of art to modify this structural form in obedience to this one great principle, that the more energetic the apparent or real crystallization of the material the more competent it seems to perform mechanical work. It will be seen hereafter that this principle also covers the nature and function of color decoration.

A rough quarry face, as well as a polished surface of many sorts of stone, reveals a vigorous crystallization, and heightens the color, and thus indirectly the apparent capability of the material to do mechanical work. The experiment may be tried with a series of cubes of one and the same stone, and of equal dimensions, which may be made to range from a rough

quarry face to a finely tooled surface, and it will be found that the rougher the surface the greater the seeming rigidity of the material. For this no mechanical reason can be assigned. A block of stone offers a resistance to a load pressing upon it perpendicularly exactly proportional to the area of its smallest horizontal section. No projections on its face beyond the lines constituting these limits can help this stone in the labor of resisting pressure; yet the stone *seems* stronger than another stone which is dressed down to an even surface at the line which is the boundary of its horizontal area. The reason why the rough stone looks stronger than the smooth one is because it betrays the nature of its crystallization, of which we know from practical experience that it serves to resist great pressure; while in stone which has been carefully tooled or rubbed to a smooth surface the natural grain is obliterated, and an artificial grain substituted, which resembles the grain of other matter (not stone), which matter we know to resist pressure but indifferently, unless the stone is further polished, and in this way again made to betray its crystallization. White marbles and other stones which are capable of being polished, but which, in that case, do not betray crystallization, do not look stronger when polished, but do look stronger the rougher their surface.

Parts of structure differ in the method and degree of their resistance to pressure imposed upon them. The distribution of the load also differs. At times it is spread equally over a large area, and then again it is concentrated upon a smaller area. An architect who is in the habit of contemplating structural parts as doing mechanical work can readily re-enforce the expression

of his material by the texture imparted to it by dressing the surface of the stone of which the parts are composed.

Carved ornament in architecture means the decoration of surfaces of stone, metal, or wood, with designs taken from the animal and vegetable productions of nature, or with geometrical forms, composed of straight and curved lines, especially applied for this purpose, or with a combination of both.

The object of decorating the surfaces of building material is again, as in the case of dressing the surface of stone, to give artificial texture to it, which shall reenforce its apparent capability to resist pressure. Small ornamentation, closely packed, with shallow intervals of limited area, corresponds with the fine-tooled stone, and large decorative ornament with deeply cut and broad recesses, with the quarry-faced stone. Corbels and capitals which carry great loads concentrated upon them are of the latter kind. An evenly and slightly loaded wall face determines the former. It is unnecessary to dwell upon the endless variety which may be designed to range between the two; but it is important to point out that a monument may be entirely covered with decorative ornament so long as the intensity of the ornament keeps step with its mechanical function, and that a monument so treated will thereby gain in force of expression. The interior of the Alhambra may be cited as an illustration of this. It appears also from the foregoing that decorative ornament is not introduced to gratify a mere craving for variety, although the variety which results from a judicious treatment of it is the first as well as the most striking phenomenon noticed by the superficial observer. When con-

sidered in the light of the principle here stated, and when the resulting system is pursued, it becomes obvious that variety must be the inevitable result, and that variety so attained also determines that harmony and unity of expression which is dictated by the mechanical laws which have ordered the masses. But if mere variety is attempted as a stroke of genius, as a work of the imagination, it is clear that it must lack both meaning and harmony, and become worthless as a work of art.

Carved ornament being intended to decorate a structural mass with the view of accentuating its function, the mass itself must not be entirely absorbed or covered up by the ornament, but must be clearly perceptible, and express in its form also the function performed by it. If the material used is stone, it must be a bonded stone first, and next a decorated bonded stone, well fitted for its relation with the rest of the structure, and for the mechanical work to be done by it. The bell of the capital and of the corbel will serve as an illustration of this. To erect a leaf or an animal form, whether it be conventionalized or not, and use this leaf, animal, or human form as a structural part, or, what is still worse, for the mere purpose of a convenient transition from one part of structure to another, is contrary to the nature of art-work. Caryatides may serve as an example of the former, and the arabesques of the Rococo of the latter transgression against art.

The solicitude to preserve intact and clearly perceptible all structural masses dictates the law also by which statuary is placed outside of the masses of architectural monuments, and according to which the tabernacles, pedestals, and canopies which form the surround-

ings of statues, are not carved into these masses, but projected from the same. It is also for this reason necessary that statuary should be placed upon pedestals, corbels, or other supports, especially built for the purpose, and should not rest upon structural parts otherwise performing mechanical functions. Bas-reliefs serve the purpose of wall decoration, the same as indicated above for carved ornament. It seems clear, therefore, that the extent of the relief must be governed by the function of the wall mass they decorate.

It is well in this connection to consider the nature of color decoration. Referring back to the surfaces of various textures mentioned above, it will be observed that the more coarse and prominent the crystallization of matter the deeper are the shadows on its surface, and the darker its general tone. This gives us a clew to the relation existing between the apparent rigidity of matter and its color. *The deeper the color of a structural part the greater its apparent resistance to strain.* As the tints ranging between white and black are innumerable, we have here again an unlimited gamut of color treatment for different degrees of mechanical work to be expressed.

Tints, however, are mixtures of crude color. Yellow, blue, and red, for instance, produce a neutral tint. If you add to the red, the tint becomes deeper; if to the yellow, it becomes lighter. To mix colors in a pot is, however, not doing art-work; it is not in imitation of nature. To form a proper appreciation of nature's method of mixing colors in tints, cover a disc with alternate spots of red, yellow, and blue, placed close together in any relation determined upon until the whole disc is covered. Take quantities of red, yellow, and

blue, equal to those which have been used in coloring your disc, and in the same proportion mix these colors by rubbing them together until they form one homogeneous mass (a tint), and then spread this tint upon the surface of another disc of the same size as the first one used. Place these two discs side by side, say from ten to twenty feet from your eye, and you will see two discs of precisely the same neutral tint, but you will notice this difference :—the first disc, although neutral in tint, will sparkle and shine as though it were lighted up with an internal fire, while the other disc will present a dull gray color without any brilliancy whatever. Now nature's method of composing tints is precisely that by which your first disc has been prepared, and this must therefore be the method employed in a work of art. Hence architects who understand the principle of color decoration never use mixed tints in monumental work. They use decorative designs instead, and produce the required tint by a judicious relation of ornament to space between ornament, corresponding to that recommended above in the composition of carved ornament. The ground is treated in crude color (red or blue) and the ornament in a lighter color (generally gold). By this means any gradation of tint can be produced and applied to the structure on the principle stated above—"the deeper the color of a structural part the greater its apparent resistance to strain."

Where in a monument the surface of all structural organisms is covered with carved ornament, and this ornament is in density and relief adapted to their mechanical functions, which it is intended to accentuate, the relation of tints throughout the structure is already

determined in the calibre of the carved ornament, and all that is needed is to apply the crude color with judgment, and the relation of tint will correspond with the carved ornament, and also with the structural construction.

The interior of the Alhambra serves again as the most successful illustration of this method; it is modeled in plaster, a material not to be recommended for its dignity or durability, and hence not to be used in a monument when it can be avoided. The surface of this plaster ornament is entirely gilt, and the spaces between the ornament are treated with red or blue.

Where a monument is built of stone, and it is intended to decorate its surface with carved ornament and color, each separate ashlar and voussoir should be designed and carved separately; it should have a narrow plain margin all around near the joints; and in that case it is well to preserve the natural color of the stone, and treat only the background in color. In many cases, however, the surface may be touched with gold lines, and picked out in places with white, and thus the highest possible effect can be attained, the natural color of the stone being preserved at the same time, which it is desirable to do, inasmuch as the texture of the stone maintains the character of rigidity better than artificial coloring can be made to do. The great principle, which may be accepted as an axiom, should be never lost sight of, that color decoration in architecture means composition of crude color—a mosaic, not a mixture.

Functional expression of decorative ornament determines design in this, that the axis of every group of ornament, as well as of isolated elements of groups, say every leaf, must be placed in the direction of resistance

to pressure, and hence that all flowing leaves hanging loosely are not architectural ornaments. Renaissance festoons are instances of the kind to be avoided. It is not in the province of this work to speak in detail of the nature of the design to be recommended for various purposes, but it should be remembered that the virtue of architectural carved decoration is to be sought less in a variety of elements than in the variety of combination of a few simple elements. The decorative work of the Alhambra may again be cited as a marvelously brilliant illustration of this principle.

A word, however, should be said on the subject of conventionalizing natural forms, when they are used for the purpose of architectural decoration. Artificial grain (texture) may be produced in stone, wood, or other building material, by cutting on its face geometrical figures, combinations of straight lines and curves, which bear the character of natural crystallizations. The human imagination resorts to methods of this kind involuntarily. Productions of the mechanic arts assume in their decoration these symmetrical shapes in the hands of persons who do not pretend to efforts at fine art. We find them in abundance in architectural monuments of every period of art history, in woven fabrics, in pottery, in the cutting of precious stones, and in articles worked in all metals. They are the true modifications of stone and metal in imitation of nature; but the forms which surround us in nature, the organisms of animal and vegetable life, present to the human mind such vivid examples of superior functional expression, and of much greater variety and multiplicity of direction than the mere molecular accumulation around a center in a crystallization, that

men have become impatient of linear crystallization, and eager to use these forms of animal and vegetable organisms in the decoration and modeling of architectural monuments and other work of fine art. It is a question of profound interest to architects and lovers of architecture, whether the pursuit of these geometrical forms would not ultimately lead to combinations which are more suited to the rigid character, hardness, brittleness and rigidity of building material, and whether these combinations might not in time rival the vegetable forms adopted for their freedom of movement and variety of outline, without losing the crystalline character which is so eminently befitting the material and its functions. It is a question now, whether we may not yet, to the advantage of architectural art, return by another road to these simple methods of decoration. However, architecture has adopted animal and vegetable forms, and made them her own; but this has not been done without a mental struggle which is not at this time fully allayed, nor universally understood. This mental struggle results in the admission that these forms, although very beautiful in themselves, are not directly applicable to rigid materials, like stone, wood, and metal; and that if they are to be applied to architectural organisms, the question must be asked and answered—if nature had attempted the creation of a leaf or a flower in stone, what would have been its modifications? How much of the leaf or flower would have been retained, and what would have been added to it, to adapt it to its new function? The answers which have been made to these questions have resulted in imparting to animal and vegetable organisms *conventional* forms whenever applied in

architecture, and other branches of fine art; and the process resulting from this is called conventionalizing natural forms.

The argument is somewhat as follows: A leaf, a tree, a plant of any kind, grows under environments differing in different directions: there is a north and a south side to every plant; a side from which blows the cold, driving wind, and another which brings warm moisture. This plant must of course be affected in its growth and development by all this; and its tendency to symmetry, which is a law of natural aggregation, is impaired by it, more or less. A stone is throughout of equal hardness, and capable of resistance to pressure or tension equally on either side of any given axis, or very nearly so; and even if not, the functions performed by it in our architectural organisms are symmetrical; hence it follows that if the form of a vegetable organism is to be adopted as part of a structure its symmetry and regularity of outline must be restored, and every other modification made which will destroy apparent freedom of action, and which will express rigidity. Again, a leaf or a flower is not capable of doing actual work: standing upon its stem in its natural condition, it yields to every breeze, bends under every drop of rain. If this frail form is to carry loads, or serve as an outside symbol of matter which is engaged in carrying loads, then it must have an appreciable fitness. It must have sharp faceted sides, which strain back rigidly against the stone it springs from. A leaf, to become a part of a structure, in one word, must become of stone, stony. To impart to natural forms a stony or metallic rigidity, to fit them in their contour, and more especially in their

sectional development, to express a performance of mechanical work, is the process of conventionalizing animal and vegetable forms when used for the decoration of architectural organisms.

It should be noted here that the introduction of straight and curved lines, and of figures resulting from combinations of these, into the surfaces of carved ornament, more especially when these surfaces are of considerable size, is an architectural necessity. It imparts to the design a structural firmness which is impaired by the flowing lines of animal and vegetable organisms. A word should be said also in this place of the unartistic tendencies and practices of the age in its decorative art. You may frequently observe, in a structure undergoing decorative treatment and renovation, workmen engaged on the outside of it in recutting, redressing, and rubbing, and polishing the stonework. The attempt is evidently one to impart to this structure an appearance of newness. On the inside, other workmen, engaged in decorating its wall, indulge in various tricks of trade to impart to this decoration an appearance of age, by now and then changing the intensity of colors and tints. The effect of light upon decorated surfaces, more especially where gold is freely used, is to change the color effect as we change our position with reference to the light. These effects are also artificially imitated by modern decorators. It is true that time mellows color to its advantage, and a decorated wall never looks as well when just finished as it will a few years after; but it is very questionable whether it is the province of art to anticipate time for the purpose of producing immediate effects. It is at best not a decent practice to be engaged in by earnest,

truthful men; and, like all shams, it meets with its punishment when time, persisting in its right to deal with art, adds its own touches, to the great confusion of the original work. Light effects upon color decoration are often marvelously beautiful. It is the province of the architect to contemplate such effects in the composition of his plans. There is art force to be discerned in the work of the man who plans and provides for the artistic lighting of his structure in anticipation of future needs, but it is a mere trick to imitate (or rather to attempt an imitation of light effects, because it is never a success), without knowing what these changes of color observed in reality are or should be.

The mediæval practice of frequently changing the design of decorative ornament, applied to different parts of structure performing the same function, is now affected by most architects. It is to be regretted, however, that the laws which govern density, texture, and color are not observed. If two piers or columns perform the same mechanical work, the capitals of these piers or columns may differ in design, but the two designs must be equal in density, depth, and force of ornament, otherwise the variety of design becomes detrimental to functional expression.

CHAPTER XXIII.

STYLE.

Methods of building as determined by prevalent ideas, by materials used, and by the progress of architects in the science of construction and in the art of expressing ideas in matter, all go to make up style in architecture.

The modern architect devotes himself to the study of architectural styles in the belief that he may thus attain to a knowledge of architecture. The result, however, is only a sort of pictorial knowledge of the successive architectural developments of the past, not a knowledge of architecture as a living art. The reason is, that the study of styles is pursued as an inquiry into forms instead of as an inquiry into the causes of forms, while the judgment arrived at as to the relative value of these forms is merely that of personal feeling, and not that of the student's reasoning powers. If architects were first instructed in the general principles of architecture which prescribe rules of procedure for the expression of an idea in matter, the matter being the whole range of building material, and the means the knowledge of construction as it exists, and the methods of art which accord with æsthetic principles, a subsequent analytical examination of the styles of the past would doubtless furnish valuable examples of given

problems solved, to the end that other problems may be solved upon the same principles. This is the course pursued in the sciences and the arts generally. The lawyer studies the laws of his own country, and practices according to those laws, although he may have devoted much time to Mosaic law, Roman law, English law, Dutch law, and the Colonial law; they all assist him in the more thorough understanding of his country's laws, and are useful also in legislation. But these obsolete laws are never adopted as a whole, and but rarely as individual provisions of law; they are simply respected as the result of principles which still remain true, and as a development of methods which may not be adopted by us, but which may be used, in modified form, shorn of merely local and evanescent features, as a nucleus for laws to meet modern needs. Ptolemy's explanation of the motion of the sun and of the planets, in epicycles, according to the hypothesis of Apollonius, is still found in every work on astronomy in which the history of that science is treated, although the system has been superseded by that of Copernicus. This theory of Ptolemy is not only interesting as denoting a wrong road to truth, but has been of assistance, since its abandonment, in determining the true places of the planets.

The painter and sculptor of our own time, as well as the poet and actor, reject nothing in the past practice of their art that is good and true in itself. They are willing to accept information, whether arrived at to-day or current in Greece before the Christian era; and they do not hesitate to abandon methods and ideas whenever they are superseded by others which are better. The architect alone works exclusively in

styles. His knowledge has become to him a faith. He believes that the style he has selected for permanent or temporary use is capable of solving all problems of to-day as well as those of two thousand years ago; and when this pious theory encounters unsurmountable obstacles, as in the case of the church of St. Peter's, at Rome, he designs a Gothic ground-plan and then envelops his structure in a Renaissance mantle, imagining that he has produced a work of Renaissance art without violence to his architectural conscience.

The explanation of this enigma is to be found in the theory that success in fine art is entirely the result of inspiration, while the guide to success is personal feeling, which is termed taste. These two gifts of nature are held to be the sum and substance of all that is requisite in art. The fact that the great authors of the Italian Renaissance were none of them architects, in the true sense of the word, must go far to prove this theory, which is cited here not to discredit the labors of the Renaissance, but to explain the style mania traceable to that period, and unknown before. But, it will be asked, are the feelings of such men as Borromini, Bernini, Brunelleschi, and Michael Angelo, to be disregarded, even though these feelings extended to a subject of which they were not masters? The more relevant question may be asked: Did not the whole learned world share this same feeling, at least to the extent of a distaste for Gothic art? Feeling in art precedes thought, and is to be regarded with respect. Antipathy to Gothic architecture, as it existed almost everywhere in civilized Europe, and more especially in Italy, during the fifteenth century, was

the forerunner of a very just and important revolution in the religious and art ideas of the world. But between a sentiment and the application of that sentiment there must be a period of reflection. This period of reflection was wanting to the architecture of 1450, and it has been wanting ever since.

It is a common belief, and one which is repeated in most works on architecture, that architecture originated in man's need of shelter; and we are told seriously, as though the authors of these works had been present when it happened, that man first lived in caves, and then built himself a hut, and finally an altar, etc., etc. Now, whatever occurred when man first commenced building, architecture did not come about in this way.

The origin of architecture must be sought in the desire of man to live after death. This short life of ours is devoted to the effort to live as long as we can, and, perhaps, help others to do the same. After this we desire to connect our individuality with the cosmic spirit, that it may outlast our body and become immortal. The conviction that death is the end of our material life has ever prompted man's faith in immortality. Coupled with this desire is another, to perpetuate this faith by some material means. Hence the monument, a mound, a heap of stones, a cairn, an altar, a temple. Man wishes to be connected with some conception of immortality which includes his species.

It is reasonable to assume that the men who built mounds and pyramids had in view personal monuments, without any clear conception of how personal virtues or merits were to be materially expressed. All that they attempted was to tell a story of the simplest kind: "Rameses lived here," and to tell that story

"forever." This eternity of physical existence is probably the sole idea they wished to convey in matter, and it needed much matter to express it. Since the pyramids were built there has been a continual advance in the essence and quality, as well as in the variety, of the thought which has constituted problems for material expression. It must be remembered, also, that the species of thought recorded in religious monuments has passed through constant modifications by which the material part of the idea has been more and more eliminated.

The Greek god is the material emblem of one god-like quality; the Christian God is the immaterial reality of all god-like attributes. To express this idea by a musical figure, it may be said that Greek mythology furnishes a long list of simple airs, and Christianity the gigantic combination of the oratorio. Every one can understand simple airs; to understand the oratorio needs a musician. The layman may be impressed by the force and magnitude of the composition, but he will never understand it. The authors of the early Italian Renaissance were laymen in architecture. They did not understand and they disliked the oratorio of Christian art, and accordingly reverted to the simple Greek airs, which were vividly presented to their minds by the revival of Greek literature.

A brief review of Roman history shows us that Rome's decay is coeval with the rise of Christianity. The fifth century found the Roman Empire a Christianized nation, a part only of her former self, and Roman architecture the remains of her greatness. In the days of Rienzi, Rome had not only lost her political influence over the world, but she had also lost the

power to govern herself. Her wealth accumulated, not like that of the rest of the world, through agriculture, manufactures, and trade, but because she was a great metropolis, the political power of which extended from the Mediterranean to the North Sea, and from the Atlantic to the East Indies. We find her, after the conquest of the Eastern Empire by the Turks, a head without a body, a prey to internal dissension, and the Bishop of Rome an exile at Avignon. When the last spark of self-government had died out in Rome, the pope returned to it to make himself its temporal master, and a reigning prince among princes. Rome at that time had existed for a thousand years without making progress in architecture. The great monuments of her past yet remaining within her walls had fallen into decay; the statuary, the gold, the silver, and the bronzes of her monuments had been appropriated to private use, and their walls were converted into quarries which furnished stone and lime for papal palaces. Popular government had subsided into that of the conclave, then consisting of twenty-two cardinals, selected from the nobles and partly also from the ranks of the people, but governed and directed mainly by scions of the imperial and royal houses of Europe, subject in its deliberations to certain recognized powers of foreign governments, as well as to unrecognized political machinations. Here the popes intended to build up a temporal government which was to exercise a spiritual power over the whole Christian world. Rome was again to become the capital of the world; her former magnificence was to be revived. To demonstrate this revival in a material way, the popes proposed to erect civil and religious monuments.

We must now try to understand the relation of the Roman artists to architecture; and in order to do so it becomes necessary to review the leading characteristics of antique and mediæval art as both stood in the fifteenth century.

Greek art dealt exclusively with single cells, the expression of one individual emotion.* Though we cannot assert positively that Greek monuments did not exist which were designed to accommodate an assemblage in their interior, it is certain that Greek temples were not so intended. Greek theaters were probably not roofed; of other habitable structures we know absolutely nothing. The Romans in their Basilicas certainly present a technical solution of the problem of housing within the walls of a monument a congregation of men, but no trace of an æsthetic consideration of this question is there to be found. The architecture of the interior of the Basilica is a repetition of the architecture of its exterior, namely, a series of columns or pilasters surmounted by an entablature which sustains a plain, unorganized wall, dividing the nave from the aisles as long as both remained under one roof, and forming the clere-story when the nave was raised above the roof of the aisles.

It may be said that neither Greece nor Rome has produced an internal architecture worthy of the name, or one which could be ranked with the interiors of the Egyptian temples that preceded them. Neither Greek nor Roman architecture has developed an æsthetic treatment of a structure containing more than one story in height. The clere-story of the Basilica is

* The Erechtheum is a notable example of failure to combine three cells into a monumental group.

rudimentary. The stories of the Colosseum are a repetion of the same element; quite satisfactory perhaps in this case, because the Colosseum, after all, is but a single cell, and its stories, therefore, equal in value as they perform equal functions in the interior. Yet this cannot be accepted as an example of a proper modelling of a many storied structure where the functions of the stories differ in import and need various forms of expression. Prior to mediæval architecture, the masses composing a monument were not modelled; their functions were merely indicated emblematically, by placing a pilaster in front of the wall, or by an architrave in front of the jamb and lintel of openings.

Whatever knowledge the Greeks and Romans had of the use of the arch, and the Romans certainly did have such knowledge, it cannot be admitted to amount to a complete architectural development, as we find nowhere modelled features which relate to lateral strains. We may, therefore, sum up the attainment of subsequent mediæval architecture as follows:

1st. All parts of structure are modelled to express their functions. These functions are successfully expressed to this extent, that the differences of dignity and vigor, as well as the comparative elegance with which mechanical work is performed by every member of structural parts, become plainly visible. The system of denoting functions by merely emblematic surface decoration is entirely abandoned. Roman architecture covered its walls with pilasters and entablatures in order to express that the walls so decorated perform the function of resisting perpendicular pressure in like manner as similar pressure is actually resisted in the Greek portico. The pilaster was substituted for the

column in order that it might be understood that this pilaster is not doing but merely indicating mechanical work. Mediæval architecture, on the other hand, embodies thought in the form of every part of the work, and thereby imbues it with life, establishes a principle applicable to the treatment of all possible structural parts which may be called forth by future needs and future efforts, and prefigures the artistic development which all possible combinations must assume.

2d. Architecture is elevated into a system which treats of cells in groups or piles, placed one above the other in stories, or alongside of each other.

3d. In the art expression of strains other than perpendicular, and the invention of a number of forms and methods of treatment to answer that purpose.

4th. In the almost unlimited application of animal and vegetable forms as surface and structural decoration as compared with the insignificant repertoire of the antique. (Of course we do not include in this sculptures of the human figure, etc.)

Now if the early Renaissance movement had been one of art analysis, there can be no question as to the course which would have been pursued by its leaders. They would have accepted, as elements of future development, all the resources of architectural art then at their command, instead of confining themselves merely to the limited resources of the antique. But it was not an enterprise based upon analysis; it was based upon feeling; and in order to understand the precise feeling of the Renaissance, and to know how mediæval architecture offended Christian men of the fifteenth century, we must learn something of the feeling of mediæval Christianity.

The mythology of the ante-Christian world was one in which men and gods lived on terms of equality and intimacy. The gods, like man, were limited in their powers and attributes; while man might, by the practice of virtue, or by a development of mere physical strength, become a god. The intercourse of men and gods was almost unrestricted and often carried to the extent of intermarriage. Appeals to the gods through the oracles were at all times open to man, and the gods frequently condescended to favor man with a personal interview. The gods were human in form, and the perfection of human beauty and physical strength was that which symbolized their might and majesty. Their work in behalf of man was human work, the overpowering of his enemies in battle.

Christianity presents a religious system in all respects the opposite to this. It is the exaltation of the Deity and the humiliation of man. Its main object seems to be to remove man from God in every sense which constitutes a definition of their related being. To exalt God, to humble ourselves, become almost convertible terms. God is all in all, man nothing. Man's virtue is not an element of acceptance in the eyes of God, nor even his faith, excepting in the sense of mercy, not of desert. To believe against conviction is his greatest merit. To do right and yet to suffer is his lot.

Virtue, no doubt, is, like truth, at the bottom of a well; we dig for it, but we never reach it. To encourage us in the effort, to nerve us with hope when we have long neglected our duty, to ascetically mortify ourselves that we may obtain mercy, is a system of faith peculiar to and proper for the ages which gene-

rated it. Christ was of the poor and lowly, and so were his apostles and those who followed in their path, and of those were the men who built the cathedrals of the Middle Ages.

That this special view of Christianity was architecturally expressed, no sane man will doubt; that it was expressed in a sublime manner, superior to all previous efforts in art creation, no man who fully understands architecture needs to be convinced; that more was added not exactly contemplated in the system, such as a great array of saints and their worship, a confessional of doubtful integrity and of an efficacy frequently pernicious, a purchasable intercession by means of masses, a large array of ascetics, of monks and nuns, who contributed nothing to the economy of religion beyond maintaining a purposeless existence, presumably devoted to the service of God; and that furthermore all these addenda to Christianity found true expression in its monuments, we all know. On this basis the poor and the lowly created temples which imposed upon and humbled princes, an ecclesiastical power being vested in the Bishop of Rome never before possessed by the high-priest of any people. All this was the result of a system based upon the grandeur and omnipotence of the Deity, and the humility and nothingness of man. When the pope decided upon the restoration of the architectural magnificence of Rome, it became necessary to deal with a new problem not theretofore contemplated by the scheme of Christianity as it then existed; it was to establish a place for the ecclesiastical hierarchy governed by a veritable monarch of the earth, a prince of the church; and the city of Rome, which had been without an architecture for a

thousand years, was now to be endowed with monuments expressing that relationship, monuments befitting the dignity of the Christian high-priest, who had cast off the lowly garb of the apostles and donned the purple in order to be a king among kings.

Again, the revival of Greek literature had brought before men the joyous and sunny humanity of antiquity, its heroic virtue, its philosophic manliness, its liberty of action, its physical beauty, all of which contrast with the gloom of an ascetic church, the misery of an oppressed people, and the lawlessness of an ignorant and vicious nobility; and when the cathedral, the palace, the moat, and the draw-bridge were discerned to be emblems of human misery and oppression, it is not surprising that men felt, without positively knowing it, that there was a connection between the evils which surrounded them and the church, which they had learned to regard as the greatest good. The monumental structure no longer represented alone the power of a moral government, but also a power which had gradually closed in upon them on every side, absorbed their substance, given aid to their enemies, and made them miserable. Human nature readily adapts itself to all conditions, if these conditions come slowly and by degrees. Man is hopeful through his faith, but when this hope was weakened by being suddenly confronted with the vitality of ancient Greece as apparent in the matchless symbols of her heroism, her joy, and her festivals, then this hope faltered and was succeeded by doubt.

The painters, sculptors, and goldsmiths who formed the art cabinet of the pope, and who knew architecture only in its outer forms, and not in its principles, contemplated cathedrals, and came to the conclusion

unanimously that this sort of art would never do in the light of classic conceptions. On encountering a stranger, we form some idea of his character at once; we suppose him to be good, generous, frank, and liberal, or wicked, hypocritical, and false. This is the impression of the moment. Works of art impress us in the same way. Look at a mediæval church, and it suggests more than years of historical study would impart. The mere sight of a work of art excites feelings which, if translated into words, the mind would repel; as it is, you only see forms which do not please you, which you may like or dislike without scruple. In this manner mediæval Christian architecture did not please the pope nor his art cabinet. Had you asked the pope the question, he would have told you truthfully, that he did not doubt the system of Christianity in the least, only he disliked the forms of its monuments as found in the cathedrals of the thirteenth century. They might do well enough for the people, but they would not do for him, nor for his hierarchy, nor for his art cabinet; he would have something which would accord more nearly, now that he was king of Rome, with the antique spirit of Roman heathenism and Roman imperialism. This was what the pope and his hierarchy thought. It would have frightened them had some one else told them that this was what they thought. But there was no danger of this; their thought was simply an impression like that derived from a picture, a statue, a play, or any other art-work. At best they had but that confused knowledge which art imparts.

An architect would have appreciated the situation at once. This would have been his argument. If

cathedrals do not express the pope's Christianity, then it must be that either the pope does not understand the art of cathedrals, or that the pope's Christianity is undergoing a change. If that change tends to a moderation in the asceticism of the church, then church architecture needs more matter and less spirit, more nakedness and less modelling, more frankness and less severity, more light and less shadow.

But the pope was unfortunate in the selection of his architects, or perhaps this is unjust to the pope, as there were no architects to select from. The pope referred the matter to artists of any kind, painters, sculptors, and goldsmiths. What was their report? They declared Gothic architecture to be barbarous; they said the architecture of the future must be developed direct from the antique. Now this was not only unnecessary, but very unwise. Why abandon the progress of ten centuries, because, upon the principles developed by it, ideas had been expressed which were objectionable? Were Grecian and Roman temples better expressions of any phase of Christianity than Gothic architecture? Or did antique forms embody principles of construction or of æsthetics by which any architect could compose monuments of the complicated ideas involved in the problems of the times? Had these questions been asked and answered intelligently we should have had no Renaissance architecture. But this was not the course pursued. The founders of the Renaissance were not looking for principles, but for forms; and not for forms which express given ideas, but forms which they liked, forms which they could comprehend, grapple with, and master—that is to say, forms that could be imitated in stone without encoun-

tering constructive difficulties. Greek forms answered this purpose eminently well, and Greek forms were determined on as the proper basis for the architecture of the future. This was not wise; it was not the best thing to do, but yet it was practicable, as long as these Greek forms were accepted as a basis merely for a subsequent further architectural development. Why has no new architecture been developed? For three hundred years men of undoubted ability have talked of developing architecture, yet Renaissance architecture is a so-called style, and not the architecture of the present time—in fact, not architecture at all. To understand this thoroughly, we must retrace our steps, and examine how mediæval architecture grew out of the antique. We must follow the road once pursued, that we may estimate the conditions of another possible road leading to a similarly successful end.

Mediæval art found but few elements in antique architecture to supply the ever-growing demands of Christianity, the complex needs of centralized governments, and the growing necessities of the individual. The Christian church adopted for her starting-point the latest creation of Roman art, the Basilica, which was a structure suitable to accommodate a congregation. As stated above, the Basilica needed an æsthetic development of its interior architecture. In the absence of such development, the Romans had made use of the then prevalent architecture of the exterior borrowed from the antique portico, consisting of columns supporting an entablature. The pediment over this entablature was omitted, and the wall of a clere-story built upon the entablature, thus dividing the Basilica into parts, a nave and two or four aisles, which were

easily roofed upon wooden girders running from wall to wall. These wooden girders grew in time into simple triangular trusses, well organized and constructively modelled, and this open timber roof of the early Basilica is an æsthetic construction not surpassed since in simplicity and elegance. It was soon discovered that the long entablatures were not safe against the pressure of the superincumbent weight. Not that they were not sufficiently strong to carry their load, but the slightest inequality in the position of the columns produced fractures which, by the nature of the lintel, became troublesome and unsightly. This evil was promptly remedied by turning arches over the entablatures, so as to transfer all the weight of the clear-story to the columns themselves. There was but one step from this to omitting the entablature altogether; but, in truth, this was not accomplished at once. The entablature was first omitted between the columns, but a fragment of it was still left standing over each column, the cornice running all around and forming an unsightly shelf which cut off from below the view of the spring of the semi-circular arches used, thus foreshortening the curve to its great disadvantage, and leaving between the column and the arch a superfluous member which rendered the whole construction apparently unstable. Finally this remnant of the entablature was also abandoned, and a square stone or springer was put in its place.

The entablature, as created by the Greeks, was the crowning feature of the temple. Its cornice adapted itself to the outline of the roof. It ran horizontally at the sides or eaves of the temple, and ascended at the gable to inclose the pediment. At the eaves and

the pediment the structure was thus *crowned*, completed. This general form as thus attained precludes the æsthetic possibility of placing above this form any further structural element. If in a second story this method of construction is to be repeated, it is clear that both the cornice and pediment must be abandoned—the architrave and frieze alone being the elements which can be properly borrowed from Greek architecture.

The introduction of the barrel vault to cover spaces, being more monumental and dignified than the open roof, was the next constructive step in the progress of church building. The walls needed to resist the lateral pressure of these barrel vaults were of necessity very thick, and the groining of these vaults and the concentration of both the perpendicular and the lateral pressure upon the piers between openings where these piers could be reinforced with buttresses, were the next steps of progress in construction. The flying buttress and the attendant load at its foot, the pinnacle, were the last elements of a complicated system of vaulting as perfected in the twelfth and thirteenth centuries.

This is what was done in the matter of construction; in the meantime art was not idle. The column could not long continue to express the function of sustaining the clere-story (more especially when the walls of this clere-story had become thick enough to resist the lateral pressure of the vaulting) without becoming inordinately large in diameter in relation to height. Square and octagonal piers, and combinations of them, assumed the place as better adapted to express the complicated forms of the arches springing from the top

of these piers. And when to these arches were added diagonal ribs, which supported the groined vault, the organization of the pier was further developed by betraying in its form, besides the square shaft which sustained the perpendicular loads, other subordinate shafts, square or round, which represented in the pier the succeeding organization of the arch and the vault. The buttress which represents two elements of resistance to lateral pressure, load and leverage, was formed narrow and deep with offsets and pinnacles further expressing these functions. To the primitive form of the Basilica (a nave and aisles) were added the transept and the highly organized choir. The aisles were frequently further extended between the buttresses in the form of chapels. The tower, a remnant of early art, which mainly depends on magnitude for its effect, has been used and developed by Christian architecture into the marvelous pyramid as we see it at Freiburg, and more especially at St. Stephen's, in Vienna. A constant transition from the strong to the elegant, which finally loses itself in crystallizations exquisitely delicate, yet vigorous and rigid and time-defying, terminates with a crowning glory this "frozen music" of architectural art.

All these new structural parts, invented and modelled by Christian art, were realities, and performed functions of the greatest mechanical importance. They expressed the spirituality and sacredness of the monument and an exalted idea of the Deity as compared with mortal man. To accomplish all this, the modelling of parts was carried to a degree of refinement which amounted to an attempt to etherialize matter, to leave matter perceptible only through a

veil of idealism. Christian architecture in this effort passed beyond the ordinary limits of apprehension; it appealed to ideas artificially generated, those especially which embodied the monastic conception of life and its surroundings.

It is this latter ascetic feature of Gothic structures which frightened the men of the Renaissance and drove them into the wilderness of Greek architecture, and prompted them to try and develop Christian architecture anew. Why did they not do it? The reason is simple and obvious. At every step forward they found themselves treading the same road pursued by the men of the eighth century, and feared to land where the men of the thirteenth century landed. Besides, they felt, and feeling was their ruin, that they were not doing Greek work but mediæval work, which with them was wrong. They assumed that Greek forms were the essence of architecture, and every change in those forms, whatever the reason for it, was a heresy against style. In other words, they proposed to develop architecture without adding to or deducting from forms heretofore created.

Let us pile many temples one above the other, they said, and set a number of these piles in a row; let us see if that will not make a Christian church, or a Christian palace, or a court of law, or a parliament house, and when we are satiated with piling up, we will crown it all with an attic of our own invention, something new, which is surely not Gothic. Nor Greek, says the derisive echo from all quarters of the globe. Look at this attic as you find it in the latest Renaissance production, the opera-house at Monaco; look at it as you find it in the great Christian Renais-

sance temple, St. Peter's, at Rome. Is it not an abomination, ruder, more vulgar, unmeaning, and unjustifiable than anything ever invented by civilized or uncivilized man? Is it in the spirit of antique architecture to pile orders one above another? Is it consistent with reason to finish a structure, and then begin it again by repeating the elements of pilaster and entablature? Can we call this an idea expressed in stone? Does it not bear the same relation to a real work of art as the repeated poundings of a kettledrum do to the septet in Fidelio? And when the Renaissance entered upon the task of æsthetically expressing interiors, for which no precedent is found in Greek work, the pilasters and the entablature were again called into requisition to line the inner side of walls, and the outer surfaces of interior piers as though they were structures containing spaces. Under the cupola of St. Peter's, at the intersection of the nave and transept, there are four noble piers measuring diagonally about seventy-four feet, noble in magnitude, for nowhere else do we find such a waste of matter doing so little æsthetic work. These piers are surrounded with the same formula of pilasters and entablature, and are belittled with niches taken out of their substance. When we examine the dome of St. Peter's, at Rome, which must, after all, be considered as the greatest outcome of the Renaissance movement, what do we find? If it had been a problem to build strongly, and make that which is strong appear weak, to build a monument of great magnitude and make it look small, to use costly materials and make them look mean, to carve statues and place them where they do not belong, or where by gravity or

position they could not possibly abide; if, furthermore, this was to be rendered more confused by tawdry carving, misapplied color, and all kinds of unmeaning decoration, that problem is solved in the interior of St. Peter's at Rome. But, says the chorus of its architects, it is antique. Not at all. It is a poor Gothic church shrouded in caricatures of Greek forms. But, says the chorus again, it is the beginning of a new era in architecture, of a new birth, of the Renaissance. And so it is, and so Renaissance architecture has continued to build for three hundred years, not always so devoid of art, for men may err in principle and yet may not always do utterly bad things; and, besides, Renaissance artists never again had the opportunity to spend so much hard-earned money upon one great art failure.

Renaissance aberration has established this one principle, however, that architecture as an art is dead; that we may work in styles, that is, we may masquerade our structures in old forms, or in whatever we may imagine to be a substitute for these old forms, or in whatever will pass current as such among men. We must, in short, cease to *think* upon the subject, and do it all by *feeling*, by inspiration, by virtue of taste.

It is wonderful that three hundred years of this inspiration and this taste have brought forth nothing more nor better than the old formula of a pair of attenuated pilasters, a bushy capital of acanthus leaves, a meagre entablature repeated over and over again in the same structure, representing at times tiers of stories one above the other; at other times embracing in one order two or three stories, or again representing

nothing, a dead wall, and all this is crowned on top with that wonderful attic of round, square, horizontal, and oblong windows surrounded with architraves or wreaths of flowers. And more than this, when we have imagined this pile or a similar pile extending for miles, and a piece cut off which we call a palace, and another piece which we call a warehouse; then a large piece called a church, and again a smaller piece, called a club-house; no architect, whose faith is in the Renaissance, will say aught against it. It is good architecture; it is a work of fine art; it shows feeling; it is in the spirit of the masters of the Renaissance. Can this be art? Surely not.

When a community for three hundred years talks of style, feeling, sentiment, inspiration, and taste, and builds trash all the while, thinking minds conclude that architecture is dead. Others again (a small minority) look with dismay upon this great waste of human labor, and conclude that it is perhaps best to begin architecture where it left off, A.D. 1450, and then the whole question resolves itself into the battle of styles. Both parties cry out, our style is best. Both parties approve anything in architecture but a departure from style—the Renaissance style, the Gothic style; and *style* is the watchword always.

And so good men and true, clever, honest, and conscientious, are working in styles instead of learning or practicing the great art of architecture.

CHAPTER XXIV.

STYLE.—CONTINUED

Of that portion of the community and the profession which, in the early part of the present century, turned its face toward mediæval architecture as the new Mecca of architectural art, a word is to be said, both in justice to those engaged in that enterprise, and to others who still continue with the Renaissance school.

Have the Gothicists been more successful than their brethren of the antique? This is a question which must be answered deliberately and candidly before considering a further course of action. At the outset lovers of Christian architecture found themselves opposed by the public, and most vehemently by an overwhelming majority of architects. The immediate result of this opposition was not favorable to progress in architecture. The controversy which ensued became a battle of styles, and the combatants rallied around their own standards as the only possible guides in art. Something was said by the Gothicists of an architectural system founded on thirteenth century work; but nothing was really done for about fifty years in that direction, certainly nothing that will find a place in future histories of architecture.

One reason why nothing was done is to be found in

the preference given to Christian architecture by those few earnest men. They had discovered a treasure which, the more they examined it, the more admirable they found it; it is not surprising, therefore, that they did not observe needed changes in the system they so highly esteemed. The discovery of the original plans of Cologne Cathedral probably strengthened this feeling. An association having been formed to complete that edifice, a number of eminent architects had prepared plans for it which were not acceptable; at all events, these plans remained under consideration for a very long time, until one day the original plans were accidentally discovered, and these were so clearly and immeasurably superior to those offered that the association without delay proceeded with the building in accordance with them. This was another incentive for the study of past architecture, which is not surprising, as no Gothic work had been done for three hundred years, excepting that which was carried on in remote rural districts and towns in Scotland, Germany, and France, by masons, carpenters, and stonecutters, who in their organizations preserved many of the methods of Gothic building.

Schools of architecture (of which many existed on the continent of Europe at the time of the Gothic revival) gave no instruction in Christian art; all archæological, æsthetic, and constructional inquiries were left to individual enterprise. It is to be regretted, however, that, with few exceptions, these inquiries have been so largely devoted to an examination of forms rather than of the causes of forms, their functions, meaning, actual usefulness, and æsthetic import. Such an inquiry again, could not, as a whole, be termed a

critical one; all Gothic work was accepted as good and worthy of imitation, because it was Gothic, and much work was done in the way of imitation. The Gothicists, like the men of the Renaissance, composed structures out of Gothic elements, without much thought whether their work was good or not.

The result, though in many cases bad, was on the whole not so deplorable as that which issued from the Renaissance enthusiasm, and this for many reasons. Much of the work done consisted of a restoration of old buildings worthy of being preserved and valuable in art history. This sort of work demanded no talent for composition, no æsthetic study, nor even much learning pertaining to construction. It was frequently conscientiously and well done. The new work undertaken did not stimulate the creative faculties of its authors, and frequently failed for the want of a clear understanding of the ideas that were treated; we may say, without much injustice, from a want of knowledge that an idea is involved in the production of art-work. Architects who work in the mediæval style, as well as those who work in the Renaissance style, too frequently err in believing that architecture is solely a matter of form, feeling, and taste. But if we remember that the scheme of mediæval architecture as we find it in the thirteenth century covers nearly all methods of construction known at the present day, and also the use of all materials now employed in building (excepting some forms of rolled iron of recent invention), and that the mediæval structures preserved to us cover, so far as their practical use is concerned, many of the purposes for which similar structures are needed now, it becomes apparent that the so-called Gothic architect

approached much more nearly to the solution of his problems than did the architect of the Renaissance. Another fortuitous circumstance is found in the extreme pliability of mediæval forms, their vast number, and the wide range of carved ornament and color decoration at the architect's command. This has made it possible for him to compose out of the elements on hand much good work without greatly taxing his capacity for the development of new forms. It is true that modern Gothic work is very much the result of what is called feeling, and frequently reflects more of the personal emotions of the architect than those of the persons for whose use the structures are erected. It is also true that what the architect loves in mediæval art is often the result of a series of causes which have no direct relation to architecture, many of them being incidental and imaginary, and many more being absolute defects even when considered from a mediæval stand-point. Enthusiasts in the profession have cultivated a taste for all this and much more which needs not to be considered here, and which is reproduced in modern work to its great detriment. Yet, on the other hand, many minds are daily comprehending the fact that an architectural monument must be developed out of its own motive, and not out of any other structure, or series of structures, no matter how good they may be, or how old. Mediæval architecture, above all, has created in modern architects a distaste for shams, a tendency to treat material in accordance with its nature, a due regard for visible construction, and a desire furthermore not to conceal construction. All this goes toward expression, which, whether true or false, is nevertheless expression, while much of it leads to

truthful expression. This is certainly a great gain over the architectural results of the past three hundred years. If the mediæval school has not redeemed its promise of independent thought and progress from a given point of departure, it must be granted that the season of architecture as a living art has fairly opened, and that the work done in the meantime is by no means entirely a failure.

The pursuit of styles in architecture originated with the Renaissance school, which holds that all architecture subsequent to the fourth century is bad and useless as a basis for future work and must be rejected. Upon this principle, the Renaissance school has acted for four hundred years without contradiction from any quarter, without opposition or interruption. At the beginning of the present century a new school of architects appeared which disapproved as injudicious this rejection of all mediæval work and recommended future progress in the art from its status at the end of the thirteenth century. This party also admitted that the monuments of the thirteenth century did not contain in their completed forms expressions of current ideas, but urged that the constructional elements of these forms should be utilized and new architectural forms developed out of the principles established through mediæval architecture.

Both parties agreed that whatever might be the additions that were to be grafted on this architectural trunk, they should not be completed forms belonging to the styles originally rejected, but must be entirely new in character and in accord with those of the parent trunk. The Renaissance architects rejected mediæval forms; while the Gothic architects rejected Greek, Ro-

man, and Renaissance forms. But both schools professed a readiness to accept improvements in architecture, meaning by this the incorporation of new and heretofore unknown forms in their favorite architectural scheme.

Art forms, especially architectural art forms, are the result of changes in ideas, in methods of construction, in materials, and in æsthetic reasoning. They are generally the gradual outcome of a series of ideas or of a series of comparisons of the relationships of matter.

To design architectural monuments, therefore, implies the due consideration of constructive necessities and of properties of materials, coupled with an analytical investigation of subjective emotions and of the methods whereby these can be expressed in a material organism. All of this tends to the development of forms. Forms, then, are a natural result of reasoning, and grow out of it without being invented. It is an error to think that the architect in his composition deals with completed organic forms, which must be either borrowed from the past or invented by an effort of the imagination. *No mental effort can create forms without due reference to a motive.* It stands to reason, therefore, that architects did not, under the circumstances, succeed in creating new forms. When architects reverted to the forms of the past, they found them labeled as belonging to a certain style, and, unless this happened to be their primary style, the forms were not available. A very surprising illustration of this may be found in the fact that Renaissance architecture never attained to anything beyond the acanthus leaf and the honeysuckle in carved decoration, and that these were tortured into forms unbecoming a leaf or a structural element

for the sake of novelty, without æsthetic results. In nature forms are the outcome of environment. Environment determines function, and forms are the result of function. Nature never essays to compose forms, she acts upon a much broader and simpler law, which governs all matter. Matter moves, accumulates, and distributes itself, and in so doing facilitates or retards relations of matter of all kinds. Every relation of matter has a certain stability, which, in highly organized matter, becomes perceptible in the shape of energy of function. This energy of function is expressed in nature in visible form. As art is re-creation, and the forms of architecture are entirely ideal, the problem to be solved may be stated thus: We know the methods by which nature arrives at her forms; shall the architect presume to create his forms at once full-fledged, complete, as it were, in their final shape; or, in other words, shall he attempt to tell a story before he has analyzed the facts to be related? Can this be done? No; what he must do is to study the conditions, analyze the environment, yield to it everywhere, respond to it always, until the functions resulting from all this are fully expressed in the organism; and while he is thinking of all this, forms will grow under his hands, forms which will often surprise him by their novelty, by their force of expression (beauty) and then again perhaps by their simplicity, which in connection with other structural parts of a more complicated and a more expressive nature serves as a foil to enhance the value of the whole. Many an earnest architectural mind has no doubt of late pursued architecture in this sense, if not precisely in this manner. There are unmistakable indications of it in modern work. This

has been done, however, in most cases as it were intuitively, that is under the pressure of a confused knowledge of the system, not with that clear understanding of it which leads to success. Many more will no doubt hereafter honestly, conscientiously, and diligently try the experiment and yet fail, and they will wipe out their composition in disgust, and substitute for it in rapid succession a series of known completed forms until they arrive at one which will satisfy their taste. Let us say to these that their failure is owing to defects partially enumerated heretofore under the head of Form and Construction, which may be more fully considered in this place.

Defects in method may be enumerated as imperfect or false cognition of the idea to be represented in matter; as a failure to illustrate the idea in fitting acts; as a misapprehension of the ensuing emotions, an inability to arrange groups which will express these emotions; a lack of knowledge of the laws of construction which govern the case, or an obtuseness in not apprehending the best construction to answer the purpose, which may result in the use of rude or undignified methods, or of methods too refined, too brilliant for the purpose; a want of comprehensive knowledge of the proper relation of parts of structure or of single cells, where this relation is determined by purely constructive necessities or possibilities; and, finally, failure may result from the fact that the form attained is still insufficiently developed. Defects of judgment consist in haste of decision before the part designed is tested in relation to the whole; prejudices acquired by an ill-directed course of education: a love of forms not on the

ground that these forms are good, expressive, or forcible, abstractly, but that the designers are familiar with them, habituated to them; a lack of general education which would otherwise enable them to rise above personal prejudices and contemplate impartially the nature of ideas as held by others, and treat these with respect; ignorance of the fact that while in most art productions absolute repose is the highest element of expression (beauty), the ugly and the sublime often play important parts in composition; and, finally, the greatest vice in architectural practice, the attempt to do too much. In addition to all this we must not omit the all-pervading error of the architect that his personal taste has something to do with the matter. Whenever we are betrayed into the reckless judgment that we like or dislike a work of fine art, because it is gratifying or the reverse to our taste, we must conscientiously inquire into the law of nature or of æsthetics which has in this work of art been exemplified or offended; and if we cannot give a clear and distinct account of it, and show on reasonable grounds what should or might have been done to make it otherwise, then let us abstain from any judgment whatever, and inquire at once into our personal shortcomings. If the word taste could be dropped out of language (at least out of the vocabulary of the artist) art would gain more than it possibly could gain by any other means. The general public may be permitted to indulge in the possession of its individual and collective taste as long as no art value is attached to its fiat, for indeed the layman cannot be expected to possess that analytical knowledge which determines the merit of a work of fine art, while it is his privilege to enjoy the results of the confused

knowledge imparted by it. Exactly this is the function of such a work in the social economy of man, viz: to be understood little or much, and to be received as information of such quantity and quality as the subject is prepared to receive, in order that he may know so much, if he can know no more.

To understand the nature of architectural styles we must examine their leading characteristics. The popular definition of styles refers solely to the use of the lintel or arch. It describes Greek architecture as a style which adopts the lintel exclusively; Roman and Romanesque architecture as styles wherein the round arch is used; and Gothic architecture as the style wherein the Gothic or pointed arch is prevalent.

That this definition of style is imperfect becomes evident when we reflect that no characteristic separating the Roman from the Romanesque styles is embraced in it, and also that Gothic monuments of recognized merit are pierced with openings covered with round arches and lintels. Moreover, the introduction of pointed openings in the walls of the cella of a Greek temple would not constitute such a temple a structure of the Gothic style, nor could a Norman monument be converted into a Greek structure by substituting lintels for its round arches.

The history of the development of the arch as a structural element, no doubt, runs parallel with the history of architecture; but this, after all, only proves the important function of construction in the art. The use of the arch as a covering of spaces, as a roof of single cells, as we find it in a perfected state in the cathedral of the thirteenth century, has been the cause of new architectural organisms, such as the buttress, the

flying buttress, and the pinnacle, which form important features in late mediæval architecture; yet the characteristic of styles cannot be referred to the presence or absence of the arch alone, nor to the form of the arch.

The ultimate aim of architecture is the expression of an idea in the form of a monument as a whole, and in the forms of its subordinate parts. If we desire to define the true characteristics of architectural styles, we must seek for this definition in the æsthetic development of architectural forms.

If we compare antique architecture, comprising the Greek and Roman styles, with Christian architecture, which includes the Romanesque and Gothic styles, we observe this important difference of treatment of form, viz: That in Christian architecture all modelling of masses is accomplished by cutting away portions of these masses; by chamfering the corners of piers, jambs, arches, copings, bases, corbels, and other structural parts; or by modelling these chamfers into projecting and receding members, which by their form and arrangement express the function performed by the part so modelled. It is important to recognize the fact that in this art process of modelling it is always assumed that the crude mass is defined by boundaries of rectangular lines, and that the modelling is accomplished by cutting away a part of this mass.

In antique architecture, on the other hand, the architectural treatment of masses consists in placing in front of openings, jambs, and arches such modelled members as in the opinion of the architect will conventionally designate function; as, for instance, the Greek and Roman architrave, which is placed in front of doors and windows, the jambs of which are

and remain square-cut openings, and the conventional use of pilasters and entablatures applied in Roman architecture on the face of the main wall of structures to designate emblematically a pier and its load. An analytic comparison of Romanesque and Gothic modelling of masses shows in Gothic architecture a consistent scheme of expressing function in mouldings. Beginning with the arches and ribs of the vaults, their salient features consist of beads and pear-shaped mouldings, grouped or isolated and joined together by large and small circular or elliptic concave curves, which are again separated from the projecting members by narrow fillets, or melt into them by a mere transition of the curves. These groupings of modelled members, when bent in the curve of the arch, express powerful rigidity at the intrados.

The rib mouldings of the vault are generally represented in the pier by a single shaft of cylindrical form —a column, in fact, surmounted with a plain or decorated capital which forms the transition from this shaft to the rib mouldings, the transverse area of which, taken together, is larger than that of the shaft. The mouldings of the main arches are often divided into several groups, most frequently into three, one of which is placed in the center, and each of which may consist of one or more mouldings. These groups are accentuated by the magnitude of the concave mouldings which separate them from the next group, while the concave mouldings separating projecting members in the same group are made smaller than these. These arch mouldings are represented in the piers by one or three shafts, also supplied with capitals for the purpose of an æsthetic transition.

In the best examples of Gothic work every group of shafts which represents the mouldings of one arch is again gathered into one base above the main base of the pier. Thus the very base of the pier plainly exhibits the construction of the main arches and ribs, and hence the formation of the vaults. Frequently the shafts supporting the ribs of the aisle vaults on the side opposite the main piers are permitted to run down to the base, the inside of the outer wall thus forming a grouped pier together with the window jambs. The outer buttresses are joined to this group, and we are presented here, in a horizontal section of these outer piers, with the collective elements of perpendicular supports and lateral abutments in the ultimate vaulting of the structure.

In Romanesque architecture only here and there isolated efforts at such a completed organism are observable. In most cases all indication of a systematic modelling of masses is wanting.

A similar comparison of the Greek and Roman styles shows in the former the fully developed portico and an entirely undeveloped cella; while in the latter the cella becomes an inhabited structure, but is not artistically developed as such, but overlaid with a mask which is but a scenic representation of the Greek portico.

At the beginning of the Renaissance period, when Greek and Roman architecture were accepted as the basis of a future art progress, the question would have been pertinent: Shall the mediæval system of modelling the masses of subordinate structural organisms be rejected or not? It will be observed that this system, as such, does not involve definite forms, and hence does not carry with it even the forms of the

style which grew out of it. It is a system which applies to every organic member of a monument, and directs that its mass shall be modelled in accordance with its function, by cutting away a part of the crude rectangular mass and leaving a sculptured form which accords with a true expression of function. It leaves nothing untouched by the hand of art; it leaves no essential organic mass in its rude shape as it issues from the hands of the architect in his capacity as a scientific constructor; it leaves no functional meaning to be explained afterward by covering the face of a mass with a mask, which is merely the bas-relief representation of another structure.*

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* To illustrate the insufficiency of this primitive expedient of Roman architecture, we need to point only to the great piers of St. Peter's at Rome which support the dome. These piers are not modelled so as to show their magnitude and function, but are covered with an order, which means a series of pilasters and entablatures. It is not, therefore, clear to the spectator that these masses of masonry are piers at all; on the contrary, it is made probable that they are inclosed cells, the function of which is not apparent, while the actual function of the pier is inadequately expressed. Again, in the exterior walls of St. Peter's, the opportunity to treat their masses in accordance with the functional meaning and spirit pertaining to the arrangement of the openings, and hence to the relation of the exterior walls to the organic development of the interior, has been neglected; and when the forms of these walls in their nakedness presented themselves to the authors of the various designs prepared for that monument, the necessity of some structure which shall be architecturally organized, presented itself to their feeling, if it did not appeal to their reason. Instead of modelling the main walls, the old Greek portico was resorted to to cover an apparent architectural nakedness, and a many-storied edifice was hidden behind a one-storied portico.

All this indicates a preference for antique forms as manifested in the column and entablature. Beyond this, it proves that the architects of St. Peter's neglected to inquire into the meaning of forms, or else they would have either rejected its ground-plan as essentially Gothic, which they did not do because of an imperfect knowledge of the relation of the ground-plan of a structure to its resulting form; or they would have erected upon this ground-plan a structure which conforms to it, and treated the masses as indicated in the ground-plan on the principle of mediæval modelling, without necessarily resorting to mediæval forms.

This same question—can we in modern architecture overlook the manifest advantage of the superior and direct expression of masses to be derived from modelling them, or must we still continue to seek expression in a mere mask because the Romans did so?—is still unanswered by all those who consider Greek and Roman architecture to be perfect styles to be imitated in form, without reflecting upon the defect or shortcoming of the system upon which these forms are based. To model structural masses is not antagonistic to the spirit, meaning, or expression of any idea, nor does it involve the use of any special form. The architect under its guidance may express in his modelling the broad and simple treatment of the Greek or the more complicated spiritual expression of the thirteenth century; he may range between the two or beyond them at either end of the series, according to the nature of the emotion which he intends to express; but he cannot persist in covering his real construction with a mere emblematic conventional construction without detriment to expression, and hence to art. Nor can he by so doing maintain the integrity of a style. This opens the broader question: Can a style be maintained in any sense in a living and progressive art? Is it desirable to accept styles in their ultimate forms as complete when reflection shows that they are not complete?

The answer to these questions must be a decided negative. Architecture is the art which teaches the *development* of structural forms. If, instead of developing forms, we borrow forms, we are not pursuing architecture as a creative art.

Then again the forms developed by the architect must be perfect in this, that they must fully express

the function of organic structural parts. If we know that more perfect expression may be attained by modelling each part than by facing it with a scenic representation of a matured architectural form, then the architect *must* so model each part, and he cannot return to Roman practice which fails to deal directly with the masses. The architect may reject Gothic forms, and necessarily must do so if the expression of the idea he attempts to materialize results in other forms, as it necessarily will, because the idea is modern and not mediæval; but he cannot reject this mediæval method of modelling structural masses. He is precluded also from using Greek and Roman forms, for the double reason that they do not represent modern ideas, and that they are not modeled upon the most perfect system now known to the art.

If we come to the wholesome conclusion that all organic masses *must* be modelled, the question of *how much* they should be modelled deserves consideration. Antique architecture failed to model all its masses, but did model salient elements of structural mass such as columns, cornices, etc. And if we insist upon it that the Greek column and cornice are an architectural development of form eminently beautiful, we must also recognize that these forms express only a narrow range of structural function.

The modelling of masses as exemplified in Romanesque architecture, although applied to all structural elements, may without injustice be pronounced to express monumental vigor more than refinement. Gothic modelling, on the other hand, seems to be an attempt at the absorption of matter in a minute and bewildering expression of thought which in its effort at clear

representation of the idea borders upon a demonstration instead. The pursuit of styles will not help us here as we cannot adopt any of the methods of the past without modification. But without adopting forms of any kind, without even contemplating the methods of modelling exemplified in styles, in order to make architecture a living art we must adopt the abstract principle—that to express functions, *all masses must be modelled.*

The history of carved ornament and color decoration, beginning with the acanthus leaf, the fret, the honeysuckle and egg and dart of the Greeks, leads us through a vast range of animal and vegetable forms, which have been conventionalized and applied in mediæval architecture, to the decoration of the Alhambra, which in design and brilliancy of color far surpasses all previous efforts.

It is admitted that the Greeks in their decoration used crude color and not mixed tints. The use of crude color in modern architecture is therefore not objected to by the strictest purists of any style. The Renaissance has practically confined itself to the ornament found in antique work; but it theoretically admits the use of all animal and vegetable forms.

It follows, therefore, that the architecture of the future must be permitted to design its carved-ornament and color decoration without being trammeled by the recognized restrictions of style; but again, as in the case of modelling the masses, it must, to preserve unity in art, apply carved ornament and color decoration in accordance with the idea which is to be expressed in the monument, and with the general principles which prescribe the technical methods of decoration.

As no æsthetic objection has ever been raised against any known method of construction, all methods of construction are of course available to the architect; it follows, therefore, that the moment architecture ceases to be a compilation, and becomes a vital development of architectural forms, the elements of these forms may be selected from the whole known range of construction, modeling, carved ornament and color decoration, and the pursuit of styles is naturally discontinued.

The question has been asked frequently, without receiving a satisfactory reply: If the forms of the past are to be rejected, is the architecture of the future to have no columns, arches, buttresses, cornices, brackets, or other organic structural features which now constitute the architectural *repertoire;* and what are we to substitute for these forms? As long as the law of gravity is a property of matter, posts, lintels, and arches of some kind will be needed to support structural masses; but we need no proof, outside of that afforded by the architecture of the past, to show that under different conditions, all these structural organisms assume different forms, and these conditions are still changing and will continue to change in the future. It may be reasonably assumed that the pier and arch of the future will bear the same relation to the pier and arch of the thirteenth century cathedral, in its vigor, expression, and decorative treatment, that the latter does to the Doric column and entablature; and also that constructive necessities will call forth new constructive forms, just as the buttress and the pinnacle have been the constructive result of the vaulted roof. But while we may expect to enlarge the architectural gamut by increasing its range both in the

direction of the upper and lower notes, and by tuning these notes more clearly to a concert pitch, it is in the possibilities of composition more than in the possibilities of the gamut that we shall find the great source of new architectural forms.

When a man enters upon the practice of architecture as a dealer in forms, keeping forms of different styles in the separate pigeon-holes of his brain, setting up structures as a child sets up blocks, being careful always to use blocks only out of the same box, he soon begins to think, and his thinking becomes a faith, that the essence of architecture is in the keeping of styles separate, and in studying hard to increase the number of pigeon-holes wherein to keep his forms judiciously divided. While science is constantly approaching fundamental laws in the hope that perhaps some day one great mechanical law will be found which explains all phenomena, the architect deals with the result of laws—with forms—multiplies and assorts these continually, and expects in this manner to attain to the production of works of fine art—to the re-creation of creation. A moment's reflection will show us that architecture must in this way become choked with the rubbish of the past, and that in truth it is so choked now. Had the Greeks, the Romans, and the architects of the Middle Ages worked in the styles of their predecessors only we should be building pyramids to-day.

Can the ideas of the present time be expressed in the architecture of any or all styles as they are now defined? It must be that the majority of professional architects and their clients are of opinion that *all* the architectural styles, at least beginning with Greek

architecture and ending with the Renaissance, are fitted to express every conceivable idea in a work of architectural art, or else structures would cease to be built in these styles, or, at least, in some of them. A critical examination shows the fallacy of this; in fact it proves that no existing style of architecture can be accepted as a basis of a work of fine art to-day without material modification of its principles and practice; a modification which would soon remove it from its present place in the list of styles. Style, we repeat, is the result of ideas, of materials and of methods of construction and of progress in artistic ability to express ideas in matter architecturally. The status of architecture at the present time and during the four or five preceding centuries has been and is inferior to that of the antique and mediæval periods. This is universally admitted. The cause must be found in a deterioration, of one or more of the elements of style, viz.: ideas, material, construction or art expression.

Now methods of construction and a thorough knowledge of the principles which relate to statics, exist to-day in a degree unsurpassed in the whole known history of the past. Nature and the mechanic arts combine to supply us with the best building material. Ideas change constantly; but no one will say that our ideas are further removed from the truth, or less capable of being expressed in emotional form, than those held by the people of antiquity and the Middle Ages. Our superiority in ideas, materials and methods of construction, over those of the past, must be granted by every intelligent and candid mind; and hence our failure as architects must be attributed to our lack of ability to represent ideas in matter, which

is a lack of the art element in the process. To express this fully and plainly, we must say we are not good architects, and in order to become good architects we must understand clearly wherein we are defective.

Our defect may be summed up in the delusion that we can attain to art results as good as those of the past, without pursuing the same or a similar road to that which was pursued by our predecessors, viz.: to recognize mechanical construction as the only method by which an idea can be materially expressed in a monument. We all know that an idea may be represented by painting a material act, or an emotion arising from it, upon canvas, or by cutting it in stone, or by giving expression to it in musical sounds. Now, if we desire to give material expression to an idea in a monument, we must build this monument with that view. Building in this case takes the place of painting, cutting in stone, or playing upon an instrument. We must build not only technically well, but with expression, and we can do nothing but build to accomplish our object. The moment we go outside of building we are not doing architecture, unless indeed we do something which helps the thing we have built upon principles which are again the outcome of building. Our material cannot assume form by any possible combination or modification of it other than that suggested by mechanical construction, which is building; it cannot be modelled for any other purpose excepting to emphasize the building already done, to heighten the expression of stability, elegance, boldness, and majesty in the thing which we have built, which means our construction. When we decorate and paint this con-

struction, we must do it upon principles which are constructive, or else we do not add to our constructive expression, but detract from it. Whatever we do, we must be able to explain upon mechanical principles.

If we do this well, and nothing more, brilliant architectural forms will be the result. But we shall not fully know these forms until they are completed in our structure.

Shall we refer to the architecture of the past, or must we ignore it, to become good architects? By all means let us keep in view the work of the past, not for the purpose of imitating its forms, but for the purpose of utilizing the accumulated knowledge and technical skill manifested in its works. The Greeks modelled their porticos, their columns, entablatures, and gables, but no part of their cella. There was a good reason for this; the cella represented not an idea but a mystery. This mystery was not to be represented, but enveloped, in the portico, and this was well done. In our monuments we have no mysteries to conceal, but we have ideas to represent; hence all structural parts must be modelled. The only style which modelled all its monumental masses is the Gothic style of the thirteenth century. From it alone we can learn the principle upon which this may be done, but we need not look to it for the method, "*How* it is to be done." The how depends upon our fundamental ideas, our material and construction, and not upon those of the Middle Ages. But then the Romans did not model their masses; they screened them with a scenic mask. Is there nothing to be learned from this? Yes; very much. We may learn from it that the playful use of forms does not constitute architecture. As

an attempt at architectural progress it has proved a failure with the Romans, as it will inevitably prove a failure whenever or wherever it is repeated. But then, it may be said, Roman architecture appears to us so dignified, so noble, that we cannot believe it to be a total failure as a phase of art. It appeals to our artistic sympathy, and we do not like to condemn it. It is entirely true that Roman architecture presents a phase of constructive progress unparalleled in any other epoch of the history of architecture. Roman structures command our respect by reason of their magnitude and structural development. The Romans exceeded their masters, the Greeks, in the boldness of the problems which they attempted to solve. They solved these noble problems constructively, but not artistically. We may pay due tribute to their genius, while yet admitting that their artistic efforts added nothing to our art experience, but, on the contrary, misled the architects of the Renaissance, a thousand years later, into a systematic development of errors, which, pardonable in the Romans, are not pardonable in their imitators at a time when the æsthetic fallacy of these errors has been practically demonstrated. There is one thing more to be learned from all this, viz.: That neither the Greek nor Roman, nor yet the Renaissance style, is a completed architectural scheme which can be applied to modern work, simply because no one of these contains any general system of modelling the masses.

Those architects who have anchored their hopes for the future to the Greek, Roman, and Renaissance styles, swinging with the tide in their stately architectural ship under the delusion that they are advan-

cing, will doubtless ask, at this point of our discussion, whether they are to be driven into Gothic architecture by logical arguments against their personal inclinations? There is no such intention; all they need to do is to weigh their anchor, and, if their ship is still seaworthy, take advantage of a fair wind and seek the port which is for any reason most agreeable to themselves; and, if they ever arrive at such a port, they will not find it surrounded with castles and churches of the thirteenth century. If antique and Renaissance architecture fail to supply the needs of the nineteenth century because of imperfect construction and imperfect æsthetic development, mediæval styles do not supply modern needs because of a failure to express modern ideas, although their facilities of construction and their æsthetic possibilities would not make it very difficult, under the system as it exists, to reach a perfect representation of later ideas in those styles. Yet when the work is done, the resulting monuments would bear but little resemblance to mediæval monuments—at least not to the eye of the mere connoisseur in forms.

It occurs sometimes that monuments are begun in a manner which does not in fact express or promise to express the ideas which they are intended to commemorate. May we in this case change their "styles?" When any one is telling a story, it is not good manners—or, in other words, it is not wise—to interrupt him. It is true he may tell his story bunglingly; he stammers, perhaps, or hesitates; encourage him all you can, but do not disturb him by corrections. If the story is worth telling, if the author sticks to the text, if he does not digress or pervert the truth, it is well that he should finish in his own way for the sake of

unity. But if he talks against time, to make it appear that he is telling a story; if, perchance, he does not know that there is a story to be told, or what is the story he is to tell, and still keeps on talking in the fond hope that his audience knows no more than he does himself, and that any sort of irrelevant talk will answer the purpose—it is, perhaps, best to stop this drivelling at once, and attack the subject without delay or circumlocution. The future critic will discover at once what has happened. A man has been employed to build an iron-clad, and he has gathered cedars from Lebanon to build a trireme. He is zealously intent upon a prow which adds to the sectional area of the ship, and interferes with the range of the guns; he is building up benches for the rowers, and is hard at work upon the figure-head. The people, in the meantime, have found out their mistake, and are tearing down the useless hamper, and are getting ready the armor, the steam-engine, and the heavy guns. An error has been committed, but these people were not foolish enough to persist in it; they had the good sense to correct it in time to launch a serviceable craft. If a structure is not an architectural production—which means not a work of fine art—because it fails to express the idea which is meant to be celebrated, you cannot go on with this sort of thing in unison—that is, you cannot continue with irrelevant twaddle, and yet tell a story. The sooner you stop it and begin to relate facts as they are, the better it is for the good of the monument and the interests of its builders.

Mediæval architects acted up to this principle always, and so did the Greeks and the Romans. As soon as they had become convinced that the idea could

be better expressed in any way whatever, they did not hesitate to improve their monuments while still in progress.

Examples of this may be cited in the palace of Diocletian at Spalatro, the cathedral of St. Stephen in Vienna, the cathedral of Strasburg, and many other monuments.

The Renaissance architects introduced their forms into structures which were partially or entirely completed, or in structures which had been injured by fire or otherwise, without the warrant of understanding architecture better than the authors of these structures, or without the good reason that the style which they had adopted, or which they had intended to develop, was especially expressive of the ideas which originated those monuments. They were governed by the arbitrary reason that they liked the forms of that style better. Examples of this proceeding are to be found in the Doge's palace at Venice, the cathedral of Milan, Westminster Abbey, and the interior fittings of almost all the cathedrals.

The ideas which have heretofore been commemorated in monuments, always subject to change, are at this time manifestly undergoing a revolution. Ideas are not in our time materialized as much as they are discussed. This discussion is not confined, as heretofore, to the priest and the statesman, but thrown open to the public at large by means of a free press. Many write, many more read, and all sit in judgment, upon political, religious, and social ideas.

The statesman no longer legislates for the good of his country, for the individual interests of his king, or of a privileged aristocracy, nor even for the benefit

of the people at large; he only endeavors to reflect public opinion. The priest even preaches religion with deference to public opinion; while questions of social relations, agitated from the bottom of society upwards, are fast engrossing that same public opinion. What is to be the upshot of all this is fortunately of minor importance in our inquiry, but the present travail of the monster, whatever it may ultimately bring forth, is not now specially favorable to progress in art. Men acknowledge the difficulty of arriving at the truth, but they take the liberty to doubt all things in the meantime. They are determined that Christianity is not to be as it was; they have protested against this in good earnest, and sealed the protest with a long-continued war. But, as Lübke says, "Der Protestantismus muss erst sein Princip aus der Wust erstarter Ueberlieferungen retten und es dan mit dem Schwert vertheidigen; seine künstlerishe Verklärung bleibt einer spätern Zeit vorbehalten." *

In all this we can see a marked difference between the development of ideas now, and the similar development in the past. At present the process of development is a public discussion of the idea; in the past it was a private elaboration of it. When finally matured, the idea was born with great labor and introduced to the world amidst popular convulsions, war, and social changes. But between these great upheavals there were periods of repose sufficiently long to permit art to speak in monuments, not upon the topics of the day, as we should say in our time, but upon the topics of

* Protestantism must first save and gather its principles out of the mass of traditions, and must defend them with the sword. Its artistic beatification remains to be developed by the future.

the period. There is also another difference, fortunately an imaginary one. Up to the fifteenth century leading minds knew that the people could be instructed only by pictures, by art productions; since we have learned to print, we incline to think that it can be done better by a verbal definition of ideas. Without denying that some progress has been made in this way, we need only to examine the substance of printed matter to be convinced that this small progress is not owing so much to instruction derived from scientific thought, as to the confused knowledge which finds its way into novels, plays, and other literary productions of more or less art value. To promulgate ideas we need the help of art as much to-day as we did two thousand years ago. Now what is the architect to do under the circumstances? He must first and foremost impress upon the public, and more especially upon his clients, the important function of ideas in architecture. He must demonstrate that mere form is not art, on the one hand, and that the mere discussion of an idea is not in itself an idea with which art can deal. He must hold fast to the broad elementary ideas which are the essence of human relations, and point out with untiring industry where these fundamental ideas are overlooked or neglected.

With regard to his work of developing ideas in matter, he must utilize every advance made up to the present time, not in the production of completed architectural forms, but in the causes of forms—which are methods of construction, material, æsthetic modelling, and decoration. If he finds in the past, or if he thinks that he has conceived in his mind, an architectural form of a whole monument, or of a part of a monument,

which is especially pleasing to him—which he would like for that reason to introduce in a projected monument—he must deny himself that privilege at once and with determination. He must submit to this argument: If I thoroughly understand the idea which I am to illustrate by expressing it in matter; if I understand the emotions pertaining to it, I must evolve first the single cells which will correspond to the groups of persons who are to inhabit this monument, with a view to represent the fundamental idea, and I must then select from the whole range of known methods of construction that which answers the physical relation of matter as it presents itself in this arrangement of single cells, and which, by its degree of boldness, elegance, or of simplicity and directness of expression, will correspond with the emotion to be depicted. When this is successfully completed, and the masses of the proposed monument are determined, I will so model and carve and color them that the meaning of every part of this structural organism shall become more apparent, and its ability to perform mechanical functions shall be more clearly demonstrated. I will use for this purpose any or all known decorative forms, or will devise others by conventionalizing any suitable forms found in nature or art, so long as the forms so used will answer the purpose for which they are used, viz., to heighten the effect and express more clearly the function of parts in performing their assigned mechanical work. Now when all this is done, it is not probable that the completed form arrived at, either in the monument as a whole, or in any part of it, will be at all like any architectural form heretofore produced; it will not be the form of any style; it will be a true

original development, which may not upon first trial seem very promising to its author, but which, when persisted in by the individual architect, and then by a generation of architects, will show true progress in art. If the architect then love his art; if he essays to compose a monument as a thing to be built; if he will, above all things, forget himself and his audience, and think of nothing but his work; and if he will wipe out from his memory every vestige of the baneful thing he calls style, and do that which is good and true and just only, whether it belong to the past or the present, then, indeed, he will have the consciousness of being true to art and to himself, and he will have done his share toward making architecture a living art.

CHAPTER XXV.

ANALYSIS.

Coke defines law in the abstract to be the perfection of reason; and although human laws frequently fall short of this definition, it may certainly be claimed to be true for the laws of nature, in obedience to which, in their attempt at least, works of human art are created. It follows, therefore, that art must be based upon reason, and be judged by reason only.

This is not, however, the popular belief, which refers art exclusively to the emotions, and determines art analysis and criticism to be an answer to the question, How do I like it? It is glibly asserted that art is not demonstrable by logical deduction, and must be judged by the emotions, because it appeals to them only. It is, moreover, imagined that an emotion is in no sense a mental function.

Sensuous perception consumes nerve fibre, and hence determines the blood towards the respective nerve centres. This is also the case when a sensuous perception previously had is recalled by force of memory, or when two or more sensuous perceptions are compared by the process called reflection. The consumption and supply of nerve matter are doubtless proportional to the mental effort; but the time in which this

new nerve matter is forwarded to the brain differs materially in different mental functions. Now, if this time happens to be very short, or the supply very copious, we perceive the supply to the exclusion of the mental action, and we call the phenomenon an emotion; and if a long time is consumed in the process, then the supply of new nerve matter becomes imperceptible, and the mental function gains prominence; and we call the phenomenon a thought, a perception, a recollection, or a reflection. Thus these various manifestations of mental functions are, in fact, identical mechanical processes endowed with different names, and all pertain to a comparison of matter—to an idea. Rapidity of mental action depends upon the importance and magnitude of the idea perceived, upon our interest in it, and upon the method of perception, and also upon the extent and fulness with which the idea is presented. For instance, the fact that metals differ in degree of affinity for oxygen, when stated in this simple form, leaves much to be explained which is not expressed in this generalization. To comprehend the statement in its nakedness requires no marked mental effort, but the knowledge imparted as to the action of various metals in the presence of oxygen is as limited as the statement is general. The immersion of a copper rod into a solution of nitrate of silver illustrates the superior affinity of copper for oxygen much more forcibly, and conveys a more accurate idea of the instability of nitric acid and silver as a chemical combination in the presence of copper, and the change of color going on in the fluid illustrates the superior affinity of copper for oxygen.

If by means of the electric light we project upon a

screen a magnified picture of the process by which a metal is deposited in a cell of a galvanic battery, we may produce an illustration of the above idea, as induced by the superior affinity of zinc for oxygen over that of platinum, for instance, which, by its forcibleness and rapidity of demonstration, would amount to a sensation akin to an emotion.

Works of art convey ideas with the fulness and rapidity of this light picture; and the nature of the idea conveyed is most frequently of greater human interest, more complicated in its relations, and more prompt in its illustration.

It is not surprising, therefore, that the sensuous perception of a work of art imparts to us the ideas it represents with great force and promptness. Hence comes the "emotion," to which is added the other emotion arising from the perceived art force.

We may compare the means of fine art to express ideas with promptness and force to the transformation of scenes upon the stage. The idea is rendered perfectly; we are put in possession of all we desire to know of this drawing-room or that garden: that is, their final and completed appearance; but we have learned nothing that will enable us to build a drawing-room or to plant a garden. There is a vast step from seeing a thing as it is, to knowing how it came to be. The impression gained from the sensuous perception of an object is but an initiatory approach towards a knowledge of it.

Yet it is popularly believed that the confused knowledge of art is knowledge sufficient to replace analysis; and when men desire to know art, or to teach others to know it, they ask themselves how they feel

on the subject, and communicate their feelings to the rest of mankind.

An examination of the vocabulary of current architectural criticism will help to place this matter in its true light. Architectural work is here spoken of as "satisfactory," "in accordance with good taste," "full of sentiment," "pleasing," "harmonious," "effective," "refined," or "barbarous," and "brutal."

All these expressions of approval or disapproval refer to the feelings of the critic, not to his reason.

If we should read in the latest number of a scientific journal that the atmospheric pressure at the level of the sea should be placed at twenty-five pounds per square inch, since this is a much more pleasant number to contemplate than 14.696, which, besides, is inconvenient on account of its fractional appendix, and inconsistent with the beautiful order observed in nature; or if we should read that the estimation of the velocity of light at 192,000 miles per second is opposed to cultivated taste and should be condemned as barbarous and brutal by modern civilization, more especially as the horse may be accepted as the typical representative of velocity in nature, and that its speed never exceeds twenty miles per hour, or about thirty feet per second—we should certainly begin to lose confidence in science. It will be objected, no doubt, that science cannot be cited as a parallel to art, the one being a matter of mathematical demonstration, and the other an emotional element of human work. This is precisely the error committed in modern art analysis, and it may be directly traced to the fact that the *expression* of emotion and emotional results are not accomplished by means which are emo-

tional. There is more mathematical consideration involved in the formation and modelling of an arch or a buttress than in the computation of the atmospheric pressure or the velocity of light. And the true value of a corbel or of a capital, the depth and density of their carved ornament, and their respective treatment in color depend upon a series of mechanical considerations which must be thoroughly understood by the architect before he can make these symbolic features true works of art.

The architect's habit of dealing with forms as the basis of forms has extended to the forms of his arguments, and they are by him accepted as the argument itself. Mr. Fergusson, who ardently recommends the abandonment of old forms, and who, therefore, may be cited as a theoretical opponent of received forms, in his work on the "Philosophy of Beauty in Art," presents us with a table of component elements of various arts (not fine arts alone, but all sorts of arts) somewhat in imitation of a statement of chemical elements of compound substances. In this table he seriously informs his readers, for instance, that gastronomy is composed of technics, 7 parts; æsthetics, 5 parts; and phonetics, 0 parts; while architecture is possessed of 4 parts of technic, 4 parts of æsthetic, and 4 parts of phonetic substance. He further takes the liberty of multiplying the æsthetic elements by two, and the phonetic by three, and gives the sum of the whole as the art quantity which expresses the subject. In this manner he arrives at the conclusion that gastronomy is made up of 17, and architecture of 24 art units; which means, probably, that an accomplished architect is 7-24 more artistic than an accomplished cook. He also explains a series of

curves, which, according to him, represent imponderable technic, æsthetic, and phonetic altitudes, in imitation of the curves which in science express various experimental data. As to any data of his curves, or as to any rational basis of his table, he leaves us in the dark, and thus incurs the suspicion that the whole of this scientific sham is sheer mental aberration, or what is probably true, that the author imagines a table of quantities to be convincing by reason of its form, rather than by reason of the facts contained in it; perhaps that personal feeling on matters of art may be tabulated as well as experimental data, and that when so tabulated it will command the same attention in art which is conceded to tables of similar form in science.

It can be of no interest to serious minds in the profession, or to lovers of architecture outside of it, to inquire into the philosophy of this mathematical masquerade; as, for instance, why the author therein contradicts his statement made elsewhere, "that a monument tells no story," by granting to architecture "four units of phonetic quality," with the additional privilege of multiplying this quantity by three, unless it is to learn on what flimsy notions may be founded a scientific-looking table, or how little thought is bestowed upon statistic arguments relating to art.

Nor is it possible to imagine the æsthetic separated from the phonetic, or *vice versa*. Whenever in art or in nature we find an expression of an idea, there are to be found both beauty and expression which complement each other, and neither of which can be imagined to exist alone. Whenever no expression of an idea is to be recognized there is also no beauty. All

this confusion has its cause in an imperfect understanding of the meaning of beauty, of expression, and fundamentally of art and of fine art. There is no beauty in gastronomy; the author is evidently confounding the results of pleasurable emotions with those of pleasurable sensations. Gastronomy is not in any sense a fine art, nor are heating and ventilation, nor other subjects to be found in this curious table. The author tells us also that it is difficult to determine the limits of fine art: unless these limits, and the exact meaning of fine art are determined, and a clear definition of both is obtained, all efforts to understand art will be but a groping in the dark, not an analysis.

Mr. Fergusson recommends an abandonment of all so-called style in architecture, and the initiation of a new era wherein we are to erect structures to supply modern wants without reference to the forms of the past. He says: "It may be asked, how is this system to be applied to the arts of the present day? One instance will, perhaps, suffice to explain what is meant by this, as the elucidation belongs to the conclusion of this work. Supposing some church-building society were to determine to erect a modern English church which should not be either Grecian or Gothic, or indeed any other style, but simply the best edifice for the performance of the Anglican Protestant form of worship. It would be no easy matter to procure in England a design for such an edifice, but a good premium would produce several attempts. Supposing the best chosen and carried into effect, no sooner is it built than it is easy to perceive its defects; it is too high or too long, not sufficiently lighted, or there is a glare in one part, and obscurity in another; it is not adapted

for hearing the voice of the ministrant, or for seeing the service ; the cornices are too heavy, the ornament inappropriate, and so on."

It may be observed here that all the probable or possible defects of the structure which present themselves to the mind of the author, viz.: that it is too high or too long, insufficiently or injudiciously lighted, not adapted for hearing or seeing, inappropriately modelled or ornamented—are elements of primary consideration in the composition of a plan ; elements, the nature of which is fully within the limits of the technical knowledge of the architect. The author evidently takes it for granted that the architect, in producing a design, overlooked all these points, and he deems this not only pardonable but quite natural—a thing to be expected. It is clear from this, also, that he has no idea of the relation between these technical conditions of structure and its ultimate form—the expression of the monument. He doubtless imagines that the architect, in dealing with full-fledged forms which pleased his fancy, has accidentally omitted the requirements of the structure, and that a design conceived in this manner may still be a presentable or acceptable design. He overlooks the fact that sound analysis would make such a design impossible, and the further fact that without due consideration of all these constructive elements no design could be arrived at which can be termed a work of art. He overlooks the fact that architects competent to solve such a problem could not and would not enter upon a competition, because of the well understood incompetence of the tribunal to understand the merits of competitive designs ; and also on account of the demoralizing influ-

ence inherent in competition; and finally, because the greatest and most important part of the work to be accomplished, before the preparation of the design, would of necessity be the mapping out of the ideas which are to be expressed. This could only be done well by, and with, the confidential advice of a competent architect who is retained for the service, and feels that he has the right, and that it is his duty, to speak plainly and manfully on this subject, and that the position conferred upon him entitles his opinions to respect and his arguments to consideration.

An architect who consents to compete—that is, who permits a layman to decide upon the merit of his work, to gauge it, correct it, accept or reject it—has already given up his position as a professional man. He knows well that the problem in the mind of the committee is crude, that each man already has some sort of an ideal solution of it in his mind, and that it must be impossible to clear up the subject by a personal effort, for the reason that it would require too much time and too much instruction to remove errors and prejudices, and to reduce the minds of the individuals composing a committee to that receptive state which comes from advanced education. It would need additional time and an amount of attention not to be expected from a committee for them to comprehend the principles involved and the application of these principles to a particular case. Practically, it would not be prudent to communicate beforehand the essence and strength of a possible plan, and thus indirectly to inform competitors. It is much safer to acquiesce in everything proposed, to listen to the views advanced, to adopt and elaborate those views, whether they are true or false (and

they are generally false), to incorporate in the plan all the whims of the future owner or owners, and otherwise to avoid anything which may prove dangerous by running counter to the so-called opinions or ideals of laymen, which essentially consist of nothing more nor less than the sum of the confused knowledge derived from cursory observation of things seen every day on the streets. A shrewd practitioner, who must live, and yet hopes to produce good work, is more apt to prepare one plan for adoption, and later, when he is regularly retained, present for execution another plan, which, had it been first proposed, would have never been adopted.

Let us assume, however, for the sake of the argument, that this "church-building society" is made up of wise men, and that, instead of placing themselves at the head of an art enterprise, they employ as their professional adviser an architect of reputation, lay before him their wishes, and give him the requisite time to compose "a design for an Anglican church," which shall not be of any style whatever, but a true, original poem in architecture. Such an architect would, no doubt, after serious reflection, address this society somewhat in this wise: "It is true that of late architecture has ceased to be a living art. It imitates the forms of the past, and these forms do not express the ideas of the present time; but you will be good enough to remember that our archæological museum is, after all, a collection of forms which meant something at some time. If it is your wish that I should produce a design of a monument which is to commemorate the Anglican Church, it would be well that you and I arrive at a clear understanding of the ideas which have created

that Church, and which are to-day its main stay and foundation. More than this, art is not capable of demonstrating or representing ideas in their abstract form. Art can only represent emotions which are the result of acts, which acts illustrate the ideas; and the question mainly to be answered is, 'What are the particular acts which pertain to the service of the Anglican Church; wherein do they differ from the acts performed in the Christian churches of the thirteenth century, or from the acts performed in Grecian temples?' On examining what I know of this matter," he will say, "it appears to me that the original tendency of our Church, immediately after the Reformation, was a decided opposition to many acts of worship and of Church service; but that, subsequently, the Church has become divided into parties, one of which regrets that the Church has gone too far in this direction, and the other affirms that true progress requires that we should go still further. It does not appear that the Church has ever adduced reasons against the performance of these acts, or that it has denounced them as contrary to its articles of faith, but only that they have been condemned as visibly emblematic of a Church against the practices of which we protested. It further appears that this very protest is the main foundation of our Church; but a protest is not a positive idea upon which we may base acts or emotions, and hence also not monuments. Monuments can be the result only of positive ideas.*

* In addition to this, the Church has drifted into a position on this vital question which is anomalous, inconsistent with its own professions, and subversive of its functions as the interpreter of its metaphysical views and rules of conduct.

We have now arrived at a point where we deny the right of churchmen to perform certain acts which we admit to be harmless in themselves, but

"You ask what is to be done? I answer that acts of the Church, theological ideas, dogma, religious principles must be determined by the Church itself; that while it is my duty to study religious ideas firmly established and laid before me, in order that I may express them in a monument, it is also my duty to accept these ideas as true without questioning them, for the simple reason that metaphysical and ethical relations, as expressed in systems of faith, must of necessity be approximations to truth and not absolute truth, partly because of the imperfections of the human intellect, which may in this direction never reach a positive solution; partly because, if individual minds could attain to such a solution, it could not be imparted to the mass of men so that they could comprehend it; and finally, because if universally comprehended (were such a thing possible, as it is not), then religion would not need the help of art any more than art is needed now in behalf of the multiplication table.

"While, therefore, I hold myself in readiness to *study* the positive ideas which the Church determines, to *assist* in a poetical grouping of worshippers who are to illustrate these ideas by acts, and to *resolve* the

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which we oppose as the special acts of the Roman Catholic Church, while in theory we claim to be the true Christian Church, which cannot be affected by anything said or done by any one outside of it. We tacitly admit that all acts of devotion are, if not quite idolatrous, at least perfectly unnecessary; or, in other words, that the views and dogmas of the Church are, in the main, demonstrable without resorting to the efforts of art. This theory is not avowed by many; in fact it is opposed by able and earnest leaders of our Church, yet all our practical efforts tend in that direction, and are partly the result of zeal to confirm our protest, and partly of the mistaken notion that the Reformation has transferred Christianity from the realm of the confused knowledge imparted by art, to that of the positive knowledge of philosophy. If this were true in any sense, churches would become not only superfluous, but impossible as architectural monuments.

emotions which are the result of these acts, I must content myself by laying down a few general principles, which perhaps will help you in your very necessary work, which has now become an urgent work, for it has been neglected since the days of the Reformation.

"Ideas are a relation of matter, and matter is to man a subjective perception of it, and no more. Subjective relation to the matter observed, or, in other words, our standpoint in relation to matter, as well as subjective sensuous force (ability to see, and hear, and feel, with greater or less accuracy), must always be elements in subjective perception. What is true of sensuous perception of matter is also true of that secondary perception of the relation of matter which we call the intellectual perception of a metaphysical idea. If you place a man on the top of a mountain, and point out to him at a great distance a milestone, and say to him that the milestone is within a stone's throw of the cottage in which you were born, and that both are ten miles away, he will not be able to follow you, for he has not the eyes of a hawk or an eagle. What must you do to help him? You can do one of two things: supply him with a good telescope, or point to a church steeple about a mile or two away from the point you wish to designate, which is near enough to answer his purpose. In this way the Church is the judge of the point of view of the parishioner, as well as of the abstract idea it desires to impart to him, and hence of the form the idea must assume for the time being; for it must be remembered that the parishioner is not standing still, but is *moving*—moving more than *you* think he is, judging of it from your own point of

view, and much less than *he* thinks he is, judging from his personal exertion. Permit me also to anticipate an objection which at this point will agitate your mind, viz.: Religion is abstract truth, fixed, unchangeable, and what is here suggested implies the opposite. Not at all; the milestone is there whether you can or cannot see it, always the same—immovable. The church steeple is only a means by which to fix its situation. Another further off or nearer by would answer the purpose as well.

"The Church of to-day does not mean the worship of saints, but it doubtless means the worship of God. This is a relation of man to God. The true definition of God is to be found only in his creation, which includes man, and the creations of man known as fine art, which speak of man's thoughts—of his ideas of God. In these works of human art, and in the works of nature, we nowhere find an absolute definition of God, but we everywhere find a partial exposition of him, and the sum total of these partial expositions is all we can ever know of Him. Hence we need a continuous relation with works of nature and art; but inasmuch as we cannot all equally understand what is offered to us by creation and re-creation in this way, and inasmuch as all of this is not accessible to us, we find among other creations of God the Church, which has taken upon herself the duty of placing before us such works of nature and art as she deems most conducive to our physical welfare and spiritual education, and she has nobly fulfilled this function through all time. We are her children, and she, our indulgent mother, teaches us the place we occupy in this universe; she it is who tells us of our relations to God

and to his creation, and it is her privilege to teach us in her own way. She has used this privilege by changing her methods as we grow in knowledge.

"The Church is now undergoing a change of method. Is she of the opinion that she has taught too much, and will now content herself with teaching less? She never can do too much teaching, but she may and she did teach on the same system too long; and while she is considering her methods and her means, some of us have gone out into the world and learned something by ourselves, and all of us imagine we could do the same thing if we should only try; many of us have tried and have made sad work of this self-instruction; we have gathered but little learning and much conceit, and it is high time now that the Church resume her position. Of course her methods of enforcing obedience will be changed, and her methods of instruction will be changed also. We may not learn so much by rote, and more by instruction; we need more pictures by way of illustration, and as the Church thinks the old ones useless and worn out, we will have new ones. Perhaps these new pictures will hereafter have to be changed oftener than they have been heretofore."

This, or something like this, is the manly talk of the architect who has mastered his profession and will not present designs for the judgment of laymen. The first good result would undoubtedly be a request on the part of this model society to be allowed some time for further serious consideration; perhaps, also, a request on the part of the rector that the architect should put all this in writing that it may be laid before the bishop, and a resolution that another meeting should be held for further consultation upon the sub-

ject. Of what value to architecture a continued series of such meetings might be, of what interest to the Church, may best be judged by those who are professionally related to either; that some such process must precede the designing of plans and the building of a modern church is quite certain, if it is not to be a failure which will deter other men from repeating the attempt.

Exactly what the Church *will* do in these premises must be determined by herself. She will have to contend with the prejudices, selfishness, and want of courage of her own members; she will have to oppose those who in Church matters are working in styles and are running in grooves. Yet times were never more propitious than the present for a change in the right direction. What the Church should do, it would be presumptuous in us to suggest; that the Church will think of this matter, and act upon it too, there can be no moral doubt.

What the architect will have to do when all this is in a fair way of settlement is a proper subject for discussion here. We may assert boldly that he will spend no time in useless discourse about *taste*, *feeling*, and style; nor on the refinement of the Greeks and the spiritualism of the thirteenth century.

Will he profit by the experience of the Past? Are the efforts of sixty centuries of no account whatever? Or may they help him in his future work? The author of the "Philosophy of Beauty" speaks of this; let us see what hope and advice we can gather from his prophecy. He says:

"Or again it may be asked, if I propose to throw over all precedent and to abandon at once all Grecian

pillars, and Gothic pinnacles, and all the classical and mediæval details which now make up the stock in trade of an architect, what would I propose to substitute in their place? The answer is a simple though scarcely a satisfactory one, as it is merely—'I don't know.' But if any one reflects a moment, he will see that it is impossible that I or any one else should know without at least the gift of prophecy, for the very essence of the progress is its procession towards something we do not now see, and the essence of invention is finding out what we do not know and what could not be before known."

His answer is—"I do not know;" it is the principal piece of information to be gathered from the art philosopy contained in his book. The true beginning of all knowledge is this, "I do not know;" and how natural and candid it is in the man of forms to say, "when all these forms of the past, which now are the stock in trade of the architect who works in styles are thrown aside, what do I propose to substitute in their places—'I do not know, how can any one else?'"

Now it so happens that this last question, "How can any one else?" may be answered satisfactorily. The future may be judged by the past, for indeed the past had a future which has now become a past to us, and we may see it clearly and appeal to it for information. The Romans did not throw away Greek forms, nor did the architects of the Christian era throw away the forms of the mythological past. The only set of men who ever did throw away anything that is valued in the past history of art were the architects of the Renaissance, who initiated the system of copying forms without reflecting on their meaning,

and who never did discover or care for the principles or ideas which are the cause of forms. On encountering a form which did not please them they cast it aside, and with it the thought it concealed; and when a form pleased them they accepted the form and discarded the thought all the same. But when they were to supply us with the new forms which they had promised, they searched for them in vain in their imagination, as the only available source of a new supply, because their minds lacked the very ideas and the knowledge which they had rejected; and as Mr. Fergusson looks forward to the future for the invention of new forms, he truly says I cannot know them.

Forms, fortunately for us, are not invented; they grow, if we will only permit them to do so—provided we cultivate and irrigate the soil. The forms of the future must be the modified forms of the past, the modifications being due to construction and material, and progress in understanding both. Modifications of this kind in art are of comparatively slow growth, like that of natural organisms as determined by environment. But we are living in an exceptional age, when considered in the interest of architectural art. Centuries have been permitted to pass without the architect giving any heed to the progress of ideas, to the acts illustrating them, to the resulting emotions, or to the progress of the science of construction and its relation to art. A prompt and intelligent recognition of the environment of architectural forms may lead to vast and rapid strides in their modification; so rapid, indeed, that to the superficial observer that modification will seem absolute change.

But we cannot be assisted in this labor by human

invention or by human taste. Both of these overrated human faculties point to completed forms, while in art, as in nature, forms must *grow* to be of value. Knowledge of ideas, of emotions, of technical methods which represent them in matter, positive and clear knowledge alone, creates a judgment which leads to the development of art forms, which are ideal organisms created in imitation of nature, which, in architecture and in music, always means an imitation of nature's laws.

The prevalent vocabulary of art analysis, which refers to feeling and taste as sole arbiters of art, must be abandoned, and art logic must be subjected to the same tests which govern the sciences and mathematics. Analysis of a monument concerns itself first with the ideas, acts, and emotions of its future occupants. The grouping of the occupants of a structure being determined, the spaces containing these groups may be analysed. Most modern monuments will be found to demand cells of considerable magnitude, the interior roofing of which becomes a serious question of æsthetic development and of practical construction.

The most dignified method of dealing with the roof of a monument, say a church, a room for deliberative assemblies, or a court-room, is to construct brick or stone vaultings, of which mediæval architecture affords endless experiments already made to our hands, many of which are eminently successful.

The span of an arch is limited by considerations of economy of space, material and labor, and hence we find them in mediæval work confined to moderate dimensions by the introduction of interior piers or columns. Modern utilitarianism objects to any interrup-

tion of a free and full view of any and all parts of the interior of a room. It asserts that an audience should not only be able to see the speaker or performer, but that the individuals composing it should see each other, and that this desire must be gratified. It asks with a triumphant air whether modern engineering does not provide for the construction of roofs of any span, and if it be not economical to construct such a roof of stone, why should it not be constructed of wood or iron? The truth is, that a congregation of men and women spread equally like a plaster over indefinite space is not a picture worth seeing; in fact, it is not a picture at all; it has neither foreground, middle-ground, nor background. The dignity of the possible man or woman, brought out in bold relief in a foreground limited by some structural feature, is lost in a sea of bonnets and hats, or of chignons, and of closely-cropped craniums. The individual man is nowhere to be found; there is no index of what the mass before us is composed of. A structure with emptiness as its chief excellence cannot, by any human contrivance, be made to express an idea in matter. The modern railroad station is a striking example. Posts, columns, or piers cannot, possibly, in such a structure, intercept anything worth seeing. There is everywhere an abundance of space for these between the tracks. Economy of labor and material certainly demand their use, yet most of these structures are covered with curved trusses of iron, supported by the outer walls, with spans of two or three hundred feet.

The temptation to do this may be found in the love of displaying a mechanical effort, which by the use of rolled and cast iron has but recently become possible.

Its ugliness will soon be apparent, and these exaggerated green-houses will be built no more. Here we must remember the tact and good sense displayed by Sir Joseph Paxton in the erection of the Prince Albert Exhibition building. He indulged in no such engineering flights, but remembered the law that all trusses of the same material and form are strong inversely as their length when loaded with the same weight per foot, and that the sum of the area of all the columns supporting a given perpendicular load or pressure is independent of their number (certain relations of length and diameter excepted). Here, again, we need not to seek beyond experience in the past for a sound so lution of the problem. Where an absolutely uninterrupted space becomes a necessity in the interior of a structure, or single cell forming a part of a structure, as, for instance, in a deliberative assembly or court-room, the transept is a form which permits of a large open area, the piers supporting the central vault being in fact, and of necessity, placed outside of the assembled audience.

But the construction of vaulted roofs, as developed in the Middle Ages, may be considered as a mere empirical experiment when compared with vaulting made possible by the progress of science. The circle and the ellipse (its resultant in groined arching) demand ideal loads to bring the line of pressure in the centre of their voussoirs—loads, which differ materially from the actual loads needed for their construction. The lines of pressures themselves, if scientifically applied, will not only lead to new and more expressive forms, to a variety of line in the cappings and ribs, to new methods of modelling and decoration, but also to a con-

struction of greater magnitude, without a proportional increase of material, both in the vaulting itself and in the abutments. It needs no bold flight of the imagination to predict that the elegance of the cathedral roofs of the thirteenth century will in time be superseded by vaulting, in comparison with which the former will appear a mere clumsy contrivance. The theory for doing this work is fully and clearly in our possession. We positively know how it can be accomplished practically. The opportunities for doing it are multiplying every day, and all it needs is the conviction that the pursuit of such a system will develop a new architecture, which, in its elegance and boldness, will far exceed the works of the Middle Ages. Nor is the labor of modelling these novel masses beyond the power of the architect, if he will only abstain from reverting to old forms.

The open-timber roof is a legitimate construction where economy permits nothing better. The prevailing vice in the treatment of this part of structure in wood is the introduction of arched pieces. It should be remembered that a structural support, mechanically considered, can be a continuous curve only when every point of the extrados is loaded.

When, however, loads are imposed in isolated points, the line of resistance becomes a polygon, the sides of which intersect at the points so loaded, and if a curved piece of wood is introduced to take the place of such a polygon, it should contain this polygon within its boundaries. The reason for introducing arched timbers is sometimes the mistaken notion that an arch under all circumstances is the strongest form that can be given to any material, no matter how a

load may be placed upon it; or else it is a mere love for curved lines under the impression that curved lines are beautiful in the abstract. It is true, on the other hand, that any construction which does not in the most direct manner perform the work it is intended to do, becomes an element of weakness perceptible to every one, although the reason why it is so may not be so apparent.

A drawing of one pier of a monument, with its superincumbent load of wall and of arched or open roof, mathematically considered and carefully modelled, so that the members of the structural parts above are represented in the simpler members of the supports below, the latter always being of sufficient area to comprise the former within themselves, as the trunk of a tree equals the sum of the area of all its branches, forms the key-note of the most complicated monument, and contains in its dimensions the elements of proportion of the masses which are needed to make the monument a work of art in imitation of nature.

The next step in the analysis of a projected monument is the contemplation of every cell pertaining to it as a separate design. The course ordinarily pursued is the reverse of this. The architect forms in the outset an imaginary picture of the whole monument, and subsequently apportions parts of this whole to the separate cells. In the minds of architects who proceed in this way, the exterior of a monument conforms to a certain imagined ideal modified by the configuration of the ground upon which it is to be erected. In fact, the design of the monument should precede the selection of the site, while the general form (the exterior of the monument) should accrue from a judicious

grouping of its single cells after they have been separately studied and matured. This is not to imply that no modification of the form of the single cell is permissible after it has been separately designed. Such modifications become necessary by reason of a relation with adjoining cells; but the full import of every cell must have been mastered before such a relation and connection is attempted. In short, the monument, to be a work of fine art, must be an aggregation of single cells, each of which is a complete organism in itself, and should not be an imagined whole to be subsequently divided into compartments.

Inasmuch as single cells do not always need to be lighted from all sides, the dead wall of such a cell of necessity becomes at times a part of the exterior of a monument. This is not to be regretted. A bit of uninterrupted masonry is a great benefit to a design; it speaks forcibly, and helps to tell a story. The habit of modern architects of laying down arbitrary outlines of a structure before considering its single cells, is often the cause of piercing an outer wall with many and large windows. The mass of the wall is nowhere felt. The truth is, we do not build walls pierced with windows, but design endless windows surrounded with the least modicum of wall that is necessary to sustain the fabric. This habit has developed in the modern architect a dread of wall space which is greatly detrimental to art.

It happens, however, from time to time, that the openings in parts of a structure have to be greatly multiplied. The constructive necessity of a wall so pierced leads to a greater thickness of wall than would be needed if piers between openings could be made

broader. The æsthetic necessity of such a wall runs precisely in the same direction. Its thickness must be expressed by a visibly greater depth of window-jamb.

The division of single cells into bays demands analytical consideration at the hands of the architect. The greater the number of bays, the more slender and elegant becomes the form of the piers, and the greater the apparent depth of the single cell both in the interior and exterior.

The mediæval cathedrals are greatly admired for this characteristic arrangement. Yet as the degree of elegance to be attained depends upon the idea represented in a monument, it is desirable to modify features of this kind in accordance with the nature of the idea.

In secular structures, where the grouping of the openings takes the place of a marked division into bays, the same law is to be observed.

It is frequently desirable to light single cells of great altitude by two and even three tiers of windows. Interior galleries suggest themselves as a constructive reason for such an arrangement, but the proper illumination of the interior very often demands it without the presence of any constructive cause.

It is necessary, in this case, to indicate externally a relationship between these two tiers of windows. The fact must be made patent that there is but one story, but one single cell. Sill courses of the upper tier of windows should be subordinated in magnitude and projection to other sill or belting courses, which elsewhere in the same structure express a division of stories. The windows of the upper tier may be wider than

those of the lower tier, or its windows may be couplets over every single window below, or they may be arranged in a continuous group extending through the whole length of the cell.

No attempt to join the upper and lower openings under one arch will successfully express the true structural relation in such a cell. That the openings of two or more stories cannot be joined together in this manner is self-evident.

The thickness of walls and piers constitutes an element, and hence an expression of strength, as well as their width. To make the thickness apparent, the doors and windows should not be placed on the outside, but in the middle of the wall, a practice not observed in modern structures.

During the decadence of mediæval and the rise and progress of Renaissance architecture, innumerable false structural forms and the misapplication of true forms became current in architectural practice, such as gables which do not meet at the apex, double-curved arches and flying-buttresses, gables designed as independent structures worked in bas-relief upon the main wall, and key-stones unwarranted by the pressure imposed upon arches in the face of walls. That a gable which has no apex is ugly, because it fails to perform its function, is apparent without further reflection; but to convince the architect that the same is true in the case of double-curved arches and flying-buttresses needs a computation of their moment of resistance Such a computation will in all cases protect him from the vagaries of his fancy, and will not only show what forms are ugly, but also those which are indifferent, good, or brilliant.

Modelling, carved and color decoration, accentuate the construction. They demonstrate function. If the construction of a monument is good or brilliant, modelling and decoration make this more apparent; if the construction is bad or indifferent this is also accentuated by modelling and decoration.

It is very desirable, therefore, that no modelling or decoration should be entered upon in composition until the construction is fully developed. It would be of great benefit to architectural composition to prepare a full set of drawings of every proposed monument upon which not a single moulding or ornament is to be seen, nothing but bare constructive masses. The common practice is the reverse of this. The architect begins his sketch by filling it up with modelled and decorative work. He is misled by its pleasing effects into the belief that the structure he is designing will be a work of architectural art, while he is in fact engaged in hiding its ugliness from himself. Where great masses seem to crush attenuated supports, instead of inquiring whether these masses should not be reduced, or, what is more frequently needed, the piers strengthened, he partially covers the masses with ornament, under the mistaken notion that they are thereby reduced in quantity. When, for reasons of economy, decoration cannot be indulged in to the extent to which the author of a design would like to carry it, he often inordinately enlarges his openings to annihilate the masses surrounding them. Practices of this sort are habitually carried to such an extent that the architect begins to look upon a design as an aggregation of ornament, and not as a mechanical structure of masses of masonry.

It may be questioned whether it would not be best to reserve all modelling and decoration for the detail drawings, and not introduce either in the general design of a monument. By the present practice of completing drawings through the introduction of all detail, composition has ceased to be a process of reasoning, and has become a matter of feeling, and this feeling in most cases proves to be a delusion. It is the experience of practicing architects that the excellence of their work depends upon constructional perfection first, and upon careful and studied modelling and decoration afterward, and yet singularly enough many academies demand of their pupils rapid architectural sketches as a proof of proficiency, which are judged more with reference to the decoration they display than to the construction they contemplate.

The modelling of the masses is a very essential element in architecture, and constitutes a noble characteristic of style. The architecture of the thirteenth century developed a large variety of modelling arising mainly from a variety of grouping of a few well-designed members.

To understand architectural modelling it is desirable to examine more minutely the methods of the best mediæval work, in order to learn wherein consists its excellence and also to avoid its defects.

It is this method of modelling which imparted to Gothic architecture the peculiar character which subsequently became obnoxious to the authors of the Renaissance, and which also became the source of the premature decay of the style.

We know that the system by which piers and the jambs of openings, arches, ribs, etc., are modelled, by

cutting away part of the wall substance, originated with Christian architecture. It was not practiced in Greek or Roman structures. It begins with the arrangement of the masses themselves, and extends to a modification proceeding perpendicularly as well as horizontally.

It will be best understood by laying out a ground-plan of a cathedral; first, in simple lines to represent the boundaries of the nave and transepts, and connecting the lines of the nave on the east side of the transept by a polygon representing the apse. These lines should coincide with the center line of the clere-story walls. If to this we add other lines running through the center of the outer walls of the structure we have the contour of a cathedral, the longitudinal and transverse arms of which consist of a nave and two aisles; but if on the outside of the nave lines we draw two lines representing the boundaries of two aisles, we have a church of five longitudinal and three transverse aisles, somewhat the same as the cathedral of Cologne. If we now traverse these lines at right angles, at every point where it is intended to support the clere-story, with a series of lines extending to the uttermost projection of the buttresses, we have a skeleton of the axial lines of the wall masses of a Gothic cathedral.

It is outside of the scope of this work to enter upon the purely mechanical reasoning which determines the various thicknesses of the walls of which this line skeleton represents the central axes, but we may imagine this done and then draw the thicknesses of these walls by marking heavy lines denoting their boundaries on either side of the skeleton lines. If we now proceed to cut openings into these longitudinal and transverse walls which will serve to open the whole

interior, and also to connect it with the outer air, taking care everywhere to leave a jamb which may serve for the support of the resulting arches to be modelled hereafter, we have as the result of all this work the due form of the main masonry which constitutes a cathedral, less such parts as may be needed to organize its vaulting. The piers supporting the clere-story, and also those supporting the wall separating the aisles, will have the form of a Maltese cross, and those forming the outer walls that of a Latin cross, the long arm of which constitutes the buttress; and if this process of cutting away unnecessary wall masses is further continued above the aisle roofs, we have also the flying-buttresses.

The moment of resistance to lateral pressure of a buttress is directly as its mass multiplied by its leverage (which is the distance of its center of gravity from the outer limit of its base in the direction of the lateral pressure). It follows, therefore, that a buttress, the perpendicular section of which is a right-angled triangle, will contain no more material than one the section of which is a parallelogram of the same base and of half its height, while the moment of resistance of the former is to the moment of resistance of the latter as four is to three. This simple mechanical principle is the foundation of the modelling of the mediæval buttress with its offsets and pinnacle, a refinement of form which tends to greater mechanical results with the same mass, and also to greater æsthetic expression.

It is this mechanical reasoning which dictates a succession of buttress offsets and the formation of the pinnacle, a species of perpendicular modelling which corresponds with the horizontal modelling of piers and jambs.

It must also appear from the foregoing that the piers accruing under this system must vary in magnitude, and that those at the intersection of the nave and transept must be the largest. The supports of the roof vaulting, however, must be added to the ground-plan of those piers. It falls naturally into the rectangular corners formed by the cross. To model and form these piers, buttresses, pinnacles, flying-buttresses, main arches, and ribs, and to connect these forms at points of juncture by means of proper members of transition (capitals, bases, etc.,) was one part of the æsthetic system of Gothic architecture. The circular shaft suggested itself as the most available shape for the perpendicular members of the piers which are to support the superincumbent arches and ribs. The connection of shafts with each other, and their relation to the main mass of the pier, became problems solved with greater or less success in the great works of the middle ages.

To say that this elementary system has not in any instance been consistently followed throughout, is only saying in other words that architecture, in spite of its great progress in the thirteenth century, did not reach perfection. That the aim was the most logical sequence of a most refined method of construction is not denied by any one, but its failure of complete success cannot be attributed to any one cause.

The main cause of failure may be found in the fact that the formation of the crude masses as here described was in no instance fully realized by mediæval architects. The law by which the structural masses were to be first established and subsequently modelled by cutting away a part of these masses, although

strictly observed in the formation of jambs, arches, ribs, buttresses, and pinnacles, was not observed in the case of the piers supporting the divisions of nave and aisles. The form of these piers was derived directly from the column. The mediæval pier was not as above suggested, a Maltese cross first, and a modelled pier determined by that form afterward, but it was an arbitrary grouping of sustaining shafts around a cylindrical pier which was accepted as its nucleus.

This arbitrary arrangement of perpendicular shafts was pursued with a looseness and disregard of the masses which should be the basis of their order and relation, which in most cases converted these piers into an unmeaning bundle of shafts. The expression resulting was weak and inefficient in denoting the gigantic mechanical work performed by these structural organisms.

Toward the end of the thirteenth century the very meaning of these elementary shafts constituting the main piers, and their relation to the grouping of the superincumbent arches and ribs, was no longer understood, and the architects of that and the subsequent period, instead of referring the magnitude and arrangement of members of piers to defined function, permitted their imagination to prescribe arbitrary forms without meaning, which, instead of expressing and emphasizing mechanical function, only dismembered and weakened these very important structural masses.

To understand this want of clearness, and the definition of the nature of the system, we must mentally transfer ourselves from this age of printing and of organized schools to an age of traditions and apprenticeships; otherwise we shall fail to comprehend how the attainment of individuals constantly

occupied in actual building became in its theory lost with the termination of their individual labors, although it continued a sort of enigmatic life in their completed works, to be solved or not by their successors, according to their ability, opportunity, and earnestness in the pursuit of art. Many masters who studied and admired this modelling of interior structural parts, and who in their works show attempts at imitation, evidently reverted to a cylindrical, central nucleus, to which the outer members are simply added, a process which is inconsistent with the fundamental element of the system, which demands that all members shall be wrought out of the solid of the crude mass. Many others referred the modelled sections of piers, arches, and ribs to squares, triangles, and combinations of these, which they imagined themselves to have observed as the leading lines of these sections in completed works, or which they had been taught to consider such by masters who did not wish to communicate the true principles involved, or who preferred to indicate the rules to be observed by convenient lines, in order to instruct a subordinate in accordance with his position and attainments.

The other part of the æsthetic problem to be solved was to establish a system of modelling external surfaces, mainly the faces of buttresses, pinnacles, and other wall faces which seemed to require treatment.

Our skeleton ground-plan mentioned above shows that in the Gothic scheme the windows occupy the whole space between buttresses, if we except the mass of the jamb which immediately adjoined the buttress. Yes, even this jamb is omitted in the Ste. Chapelle at Paris, the arches springing directly from the buttress

without the intervention of a perpendicular jamb, and in similar minor constructions to be found elsewhere.

This mechanical arrangement gave rise to the mediæval tracery with which we are familiar. The mullions terminate at the spring of the main window-arch, and are thence united by a system of arched stone-work, which in the best models is based upon a rigid principle of mechanical construction, and is not, as Mr. Ruskin believes, a mere frame of spaces which are, according to him, the subject of the design; that is, the spaces are the result of, and the mullion mass is the object of, design. This tracery is one of the most elegant productions of mediæval art reasoning, and conveys a most perfect expression of its function—that of a pierced curtain wall between two buttresses, which are the real supports of the structure. When mediæval architects bethought themselves of a proper method of decorating the exterior wall-face, they found this window tracery in an advanced state of perfection. They admired its form, and applied it to their buttresses, pinnacles, wall-faces, gables, and door-heads.

There can be no question of the propriety of its application to free standing gables, but we may doubt, without disrespect to the art of the past, whether the use of tracery on the face of the wall, more especially on the face of the buttress, is conceived with the logical clearness of other mediæval modelling. Mainly it may be objected that it is not expressive of a mass doing energetic mechanical work; on the contrary, it originates with a structural feature, which, inclosed in a rigid frame, is doing little more than to sustain itself. The recurring perpendicular mullions impart to it an expression of weakness, and this weakness is again im-

parted by it to the structure, the strength of which it should emphasize, in order to be in truth artistic modelling.

While tracery applied to an opening is capable of numerous variations of treatment, and hence of form; so long as its density of mass remains unchanged, all efforts to change its density in order to express various intensities of strength have failed. In truth, the practice has been to multiply mullions in the upper masses of structure, as compared with those of the lower parts of the same building, under the mistaken impression that greater richness of modelling must convey an expression of greater lightness as well, which is not true; and finally, the variations possible in this direction are also insufficient in number to supply degrees of intensity enough for the multiplied use of a tower like that of Cologne, for instance, where the modelling of surfaces is begun at its very bottom. When we contemplate the use of tracery as applied to the towers of Strasburg, as a sort of net-work not used in accord with the masses, but laid over and separated from them, although in this case it is not quite so injurious to the apparent force of the masses, we find it to be an experiment of doubtful value in architecture; an experiment which contains more elements of playfulness than of vigor.

There is another infelicity in a frequent perpendicular division of the stones composing a work of masonry. It imparts to the wall an expression of weakness, because, in order to resist perpendicular pressure, indications of laminæ in bonded stone-work, if perceptible in any manner whatever, or indicated by any process or form, should be horizontal and not perpendicular. It

is true that in Gothic architecture perpendicular structural forms justly predominate over horizontal forms by reason of the system of construction which pervades the style, and that in consequence the buttress system prevails over the cornices and beltings which everywhere abut against them, and which are also properly overshadowed by rising gables and pinnacles; but there is no good reason for a perpendicular subdivision of organic structural masses, more especially as by such a subdivision the functional expression of these masses is weakened, while it is a fundamental law of modelling that it shall help to emphasize mechanical function.

A close examination of the exterior of any of the Gothic cathedrals will illustrate this defect, and a comparison of those cathedrals where much of the wall surface is left without modelling with others where the exterior surface is entirely covered with tracery will plainly show the architect where to look for the cause of the defect.

The modelling of architectural masses is a principle conducive to expression, and furnishes to the architect the most consistent and logical grounds of proceeding, but modelling of masses means that we should modify crude form with a view to heighten expression of function, and it means also that this crude form is not to be entirely annihilated—that through all the modelling the mass must be felt. It must be felt not only as a thing concealed in the members surrounding it, but a part of its natural crude form as it emanates from the hands of the constructor must be seen also. This is entirely overlooked by late mediæval architects.

Instead of attempting to make matter speak of func-

tion, the moment they discovered the possibility of doing this they proceeded to model matter out of existence. They flattered themselves that this phonetic quality of matter, which they called spirit, and which by naming it so they imagined to become an entity detached from and independent of matter, may be retained and the matter, if not entirely abandoned, may at least be concealed, removed from sight.

The interior piers, arches, and ribs thus became bundles of functional shafts and modellings without anywhere betraying the wall-mass, of which they ought to have been a modification.

The expression imparted to architectural masses by this excessive modelling, and by masking them with tracery, is what displeased the architects of the Renaissance, not without good reason. A clear conception of the cause of this displeasure would have led to a correction, without an abandonment of the system of modelling architectural masses, as well as to a conviction that structural masses can gain nothing in expression by being masked with forms, no matter how beautiful in themselves, if these are not the logical sequence of function. The Renaissance school continued the mask used by the Romans to represent a scenic picture of the Greek portico, which is not modelling structural masses, and adopted out of the errors of the Gothic school the use of the panel, a sort of crude imitation of tracery, which is also not æsthetic modelling.

This Renaissance panel we find introduced on the underside of girders, on the face of pilasters, on the jambs of doors and windows, etc. And in all the places where it is used it proves inconsistent with the

nature of the material and detrimental to expression of mechanical function.

The history of architecture since the thirteenth century has ceased to be the record of a development of artistic forms by a clear representation of mechanical function and by logical methods of accentuating this function in modelling, carved-ornament and color decoration. It has become a licentious use of unmeaning forms, which culminated in Gothic architecture in the cathedral of Milan, and in the Renaissance in such buildings as the Zwinger in Dresden, the Tuileries, the Court Napoleon in the Louvre, and in kindred structures all over Europe.

CHAPTER XXVI.

CRITICISM.

Prof. Brande, in his Dictionary of Science, etc., defines criticism to be "the art of judging with propriety concerning objects." Inasmuch as the objects found in nature are admitted to be perfect organisms, which in all cases perform and express their functions, they are not objects of which men may judge, and which may be properly considered as subject to criticism. All we can do with regard to these is to analyze them with a view to elicit truths, principles, and natural laws. It is clear, therefore, that the objects referred to in the above definition of criticism must be objects created by men. Nor can criticism be confined to objects alone. Ideas as we find them developed in science and literature, facts as related in history, emotions as expressed in art, are all proper subjects of criticism.

"In a somewhat more limited but still extensive meaning," continues Prof. Brande, "the province of criticism is confined to literature, philology, and the fine arts; and to subjects of antiquarian, scientific, or historical investigation. In this sense, every branch of literary study, as well as each of the fine arts, has its proper criticism as an appendage to it. The elements of criticism depend on the two principles of beauty

and truth, one of which is the final end or object of study in every one of its pursuits: beauty in letters and the arts; truth in history and the sciences. The office of criticism, therefore, is first to lay down those forms or essential ideas which answer to our conception of the beautiful or the true in each branch of study, and next to point out by reference to those ideas the excellence or defects of individual works as they approach or diverge from the requisite standard in each particular."

It is proposed here to lay down "forms or essential ideas which answer to our conception of the beautiful or the true," and then test individual works by these forms and ideas. It is clear that these forms or essential ideas cannot be an arbitrary creation of our imagination; they must inevitably be based upon truths outside of ourselves, which may be recognized axioms or sound conclusions derived from them, but in all cases actual and verified truths. Why in that case a distinction should be made between the principles and laws on which truth and beauty are severally founded is not apparent. A door is left open to the suspicion that recognized ideas of beauty are opposed to truth, or that they are only approximate truths, which means again either that something is not fully or clearly defined, or that something well defined is not entirely true.

Prof. Brande explains more fully in the following remarks: "Among the classical ancients the criticism of beauty was carried to a high degree of perfection. Less encumbered with a multitude of facts and things to be known than ourselves, their minds were more at leisure and more sedulously exercised in reflecting

on their own notions and perceptions; hence, the astounding progress which they made in the fine arts."

Personal notions and perceptions are here supposed to lead to great progress in the fine arts, while facts and things are pronounced a material hindrance to the same end. Although we may not presume to define the things referred to, we are forced to the conclusion that whatever may have been the nature of the notions and perceptions of the classical ancients, they were not derived unduly from facts.

Criticism in art may be defined as an inquiry into the nature of a work of art, in order to discover its intrinsic merit.

It is not the function of criticism to lay down laws by which works of art are to be judged. This is the province of the philosophy of art. Nor does criticism necessarily involve a final judgment on a work of art; its legitimate purpose is to analyze art-work with due reference to art-principles, and to permit others, say the readers or hearers of criticisms, to draw their own conclusions. It is within the province of criticism to discuss art-works relatively to each other, but this must be done by analysis and not by mere opinion. In fact, an opinion of the relative or intrinsic merits of a work of fine art, without analysis and reference to the laws of the philosophy of art, is not criticism.

The ultimate end of criticism is to elicit the quantity and quality of creative force manifested in a work of art, also what part of this creative force is exclusively due to its author, and what part is due to the general progress of art at the time of its production.

To estimate correctly the physical force exercised by a man in carrying a burden, we have to consider not

only its weight, but also its bulk and the bulk of the man himself, for both constitute elements of load and displacement of atmospheric air; not only the distance to which the burden is carried, but also the inclination of the road upon which the man travels, whether he goes up hill or down hill; and also his means and methods, whether he carries his load in one hand, on his shoulder, or on his head.

It is even so in measuring creative force in art. When grief is portrayed on canvas, in stone, or by words, through contortion, tears, or raving declamation—the artist is carrying his load compactly and easily balanced on his head on a descending grade; but when grief is portrayed behind a smile as a sacred thing not to be divulged, then the artist is carrying his load on a rising grade, difficult to overcome. It has been shown in another chapter that emotions are represented in art by their physical functions. Now these physical functions may be many or few, they may be strongly marked or merely indicated, they may be direct or indirect functions, and yet they are functions of the same type of emotion. The difference consists in the act (*motif*) selected to express the idea. It is the judicious selection of the act which constitutes the ideal in art, and it may be laid down as a rule, that the more exalted the ideal the greater the creative force required to render it materially; and, also, the greater the progress of art in the technic which enables the artist to render the physical functions of emotion, the greater becomes the demand on art for perfected expression.

The questions which should be asked and answered in the critical analysis of an art-work, are:

1. Does the art-work express the idea as held at the time of its creation?

2. Is the act selected to illustrate the idea an ideal act, and as such what is its standard of merit?

3. Are the emotions represented in accordance with the act? Are they fully and correctly apprehended? And, finally—

4. What was the development of the technical means and methods at the time when this work of fine art was produced? Were they known to the artist? Did he make good use of them, and thus render successfully the idea as represented in the ideal act and its resultant emotions?

It may be also asked: Does this work of art betray progress on the part of its author in a successful imitation of nature or in the technical methods involved?

The answers to any or all of these questions may in legitimate art criticism be rendered in the form of an analysis of the work of art under consideration, and by means of this analysis the intrinsic or comparative value of the art-force displayed may be elicited.

The method of this system of criticism in architecture may be illustrated by an analysis of two monuments which offer salient features for comparison. The cathedrals of Cologne and Milan present this favorable opportunity in an eminent degree.

The cathedral of Cologne was conceived and designed about the middle of the thirteenth century, when Christian architecture had attained its greatest perfection, and that of Milan about one hundred years later. Both are the work of German architects, and, if the opinion of the most eminent historians is not to

be disregarded, Heinrich Arlez, the architect of the Church of Milan, attempted a monument which should excel that of Cologne in magnitude, richness of ornament, and costliness of material, and which, they say, is not unlike it in its general arrangement, as far at least as its ground-plan is concerned. The reader will best gather all this and more if we permit those historians to speak for themselves.

Of the cathedral of Cologne, Mr. Ferguson says:

That it is the typical cathedral of Germany, one of the noblest temples ever erected by man in honor of his Creator. In this respect Germany has been more fortunate than either France or England, for, though in the number of edifices in the pointed style and in beauty of design these countries are far superior, Germany alone possesses one pre-eminent example in which all the beauties of its style are united. * * * In dimensions it is the largest cathedral of northern Europe, its extreme length being 468, its extreme breadth 275, and its superficies 91,464 feet, which is 20,000 feet more than are covered by Amiens. On comparing the eastern half of these two from the center of the intersection of the transept, it will be found that Cologne is an exact copy of the French cathedral, not only in general arrangement but also in dimensions, the only difference being a few feet of extra length in the choir of Cologne, which is more than made up at Amiens by the projection of the Lady Chapel. The nave too at Cologne is one bay less in length. On the other hand, the German building exceeds the French by one additional bay in each transept, the two extra aisles in the nave, and the enormous substructures of the western towers. All these are decided faults of design, into which no French architect would have fallen.

Looking at Cologne in any light no one can fail to perceive that its principle defect is its relative shortness. If this was unavoidable, at least the transept should have been omitted altogether, as at Bourges, or kept within the line of the walls, as at Paris, Rheims, and elsewhere. It is true our long, low English cathedrals require bold, projecting transepts to relieve their

monotony; but at Cologne their projection detracts both internally and externally from the requisite appearance of length. Indeed, this seems to have been suspected at the time, as the façades of the transepts were the least finished parts of the building when it was left, and the modern restorers would have done well if they had profited by the hesitation of their predecessors and omitted an expensive and detrimental addition.

Another defect before alluded to is the double aisles of the nave. It is true these are found at Paris, but they were an early experiment. At Bourges the fault is avoided by the aisles being of different heights, but in none of the best examples, such as at Rheims, Chartres, or Amiens, would the architects have been guilty of dispersing their effects or destroying their perspectives, as is done at Cologne; and, now that the whole of the interior is finished, these defects of proportion are become more apparent than they were before.

The clear width of the nave is 41 feet and six inches between the piers, its height 155 feet, or nearly four times the width—a proportion altogether intolerable in architecture; and this defect is made even more apparent here by the aisles being together equal in width to the nave, while they are only 60 feet in height. Besides the defect of the artistic disproportion, this exaggerated height of the interior has the further disadvantage of dwarfing to a painful extent the human beings who frequent it. Even the gorgeous ceremonial of the Catholic Church, and their most crowded processions, lose all their effect by comparison with the building in which they are performed. Were a regiment of the Life-Guards on horseback to ride down the central aisle at Cologne, they would be converted into pigmies by the 140 feet of height above them. Lateral spaciousness has not the same dwarfing effect. When all are standing on the same floor distance does not diminish in a building more than in the open air, and with that effect we are familiar; but great height in a room is unusual, and in proportion as it affects the mind with awe or astonishment does it diminish the appearance of those objects with which we are familiar. Perhaps, however, the most striking defect of the internal design is the want of repose or subordination of parts; fifty pillars practically identical in design, and spaced nearly equally over the floor, and beyond them every-

where a wall of glass. If the four central piers had been wider spaced, or of double the section they now are, or had there been any plain wall or lateral chapels anywhere, it would have been better. Notwithstanding all those defects, it is a glorious temple; but so mathematically perfect that not one little corner is left for poetry, and it is consequently felt to be infinitely less interesting than many buildings of far less pretensions.

Externally the proportions are as mistaken, if not more so, than those of the interior; the mass and enormous height of the western towers—actually greater according to the design than the whole length of the building—if they are ever completed, will give to the whole cathedral a look of shortness which nothing can redeem. With such a ground-plan a true architect would have reduced their mass one-half and their height by one-third at least.

Besides its great size, the cathedral of Cologne has the advantage of having been designed at exactly the best age, while, as before remarked, the cathedrals of Rheims and Paris were a little too early, St. Ouen too late. The choir of Cologne, which we have seen to be of almost identical dimensions with that of Amiens, excels its French rival internally by its glazed triforium, the exquisite tracery of the windows, the general beauty of the details, and a slightly better proportion between the height of the aisles and the clere-story. But this advantage is lost externally by the forest of exaggerated pinnacles which crowd around the upper part of the building, not only in singular discord with the plainness of the lower story, but hiding and confusing the perspective of the clere-story in a manner as objectionable in a constructive point of view as it is to the eye of an artist. Decorated construction is, no doubt, the great secret of true architecture, but, like other good things, this may be overdone. One-half of the abutting means here employed might have been dispensed with, and the other half disposed so simply as to do the work without the confusion produced. When we turn to the interior, we see what the vault is which this mass of abutments is provided to support. We find it with all the defects of French vaulting—the ribs few and weak, the ridge undulating, the surfaces twisted, and the general effect poor and feeble as compared with the gorgeous walls that support it. Very judicious paint-

ing might remedy this to some extent; but, as it now stands, the effect is most unpleasing.

The noblest as well as the most original part of the design of this cathedral is the western façade. Had this been completed it would have risen to the height of 510 feet. This front, conconsidered as an independent feature, without reference to its position, is a very grand conception. It equals in magnificence those designed for Strasburg and Louvain, and surpasses both in purity and elegance, though it is very questionable if the openwork of the spires is not carried to far too great an extent, and even the lower part designed far too much by rule. M. Boisserée says: "The square and the triangle here reign supreme;" and this is certainly the case. Every part is designed with the scale and the compasses, and with a mathematical precision perfectly astonishing; but we miss all the fanciful beauty of the more irregular French and English examples. The storied porches of Rheims, Chartres, and Wells comprise far more poetry within their limited dimensions than is spread over the whole surface of this gigantic frontispiece. Cologne is a noble conception of a mason, but these were the works of artists in the highest sense of the word.

For the convenience of the reader, and to facilitate future reference and comparison, this criticism may be condensed somewhat as follows: The cathedral of Cologne is one of the noblest temples ever erected by man. Its eastern half is copied from the church at Amiens. It is the longest church known, yet it is too short in relation to its width and that of its transepts. English churches need transepts to relieve their monotony, this does not. It has too many aisles—true some French churches have the same, but this was done before French architects knew better. It is altogether too high in its interior, it dwarfs man, and would convert life-guards on horseback into pigmies. The most striking defect of its interior is want of

repose, because fifty pillars, practically identical in design, are spaced nearly equally over the floor. Monotony is thus opposed to repose. It is a glorious temple, mathematically perfect, hence not a corner left for poetry. Mathematics opposed to poetry. Externally the proportions are worse than internally. A true architect could never have done the like. It was designed at the best age. Its choir is much better than that of Amiens, from which it has been copied, but externally this is bad also—too rich above and too plain below, which is a discord. Decorated construction is true architecture, but this is overdone—one half the abutments might have been dispensed with. The interior vaults are as bad as any French vaults. We might paint them out somehow, but they will not do as they are. The western façade is a very grand conception, equals Strasburg and Louvain in magnificence, and surpasses them in purity and elegance, yet upon the whole it is not good, it lacks fanciful beauty. Cologne is a noble conception of a mason, but not that of an artist.

As this is not pretended to be a divine revelation, nor the pronunciamento of an architect who has built a better cathedral than that of Cologne, the most humble reader seems entitled to some reason, some explanation why apparent length is made the ultimate object of a church of God, or the main element of a work of architecture. No doubt the magnitude of Cologne cathedral is not developed in its exterior to the exclusion of every other consideration, but surely this cannot be a sufficient reason to deny to its author the title of an artist.

The same author says of the cathedral of Milan:

That it is at once the most remarkable and the largest and richest church of all the churches erected in the Middle Ages. It was commenced in 1385 and consecrated in 1418, at which date all the essential parts seem to have been completed, though the central spire was not finished till about the year 1440 by Brunelleschi. The design is said to have been furnished by a German architect, Heinrich Arlez Gamnuden, or, as the Italians call him, "da Gamundia," a statement which is corroborated by the fact that the details and many of the forms are essentially Northern; but it was equally certain that he was not allowed to control the whole, for all the great features of the church are as thoroughly Italian as the details are German; it is therefore by no means improbable that Marco di Campione, as the Italians assert, or some other native artist, was joined with him or placed over him.

In size it is the largest of all mediæval cathedrals, covering 107,782 feet. In material it is the richest, being built wholly of white marble, which is scarcely the case with any other church, large or small, and in decoration it is the most gorgeous. The whole of the exterior is covered with tracery, and the amount of carving and tracery lavished upon its pinnacles and spires is unrivaled in any other building of Europe. It is also built wholly (with the exception of one façade) according to one design. Yet with all these advantages, the appearance of this wonderful building is not satisfactory to any one who is familiar with the great edifices on this side of the Alps. Cologne, if complete, would be more beautiful; Rheims, Chartres, Amiens, and Bourges leave a far more satisfactory impression upon the mind; and even the much smaller church of St. Ouen will convey far more pleasure to the true artist than this gorgeous temple.

The cause of all this is easy to understand, since all, or nearly all its defects arise from the introduction of Italian features into a Gothic church, or rather, perhaps, it should be said, from a German architect being allowed to ornament an Italian cathedral.

Taking the contemporary cathedral of St. Petronio, at Bologna, as our standard of comparison, it will be seen that the sections are almost identical both in dimensions and in form; but, at the same time, it will be perceived that the German system

prevailed in doubling the number of piers between the nave and side aisles. So far, therefore, the German architect saved the church. The two small clere-stories still remain, and, although the design avoids the mullionless little circles of Bologna, there is only space for small openings, which more resemble the windows of an attic than of a clere-story. The greater quantity of light being thus introduced by the tall windows of the outer aisle, the appearance is that of a building lighted from below, which is fatal to architectural effect.

The model still preserved on the spot shows that the German architect designed great portals at each end of the transepts. This, however, was overruled in favor of two small polygonal apses. Instead of the great octagonal dome which an Italian would have placed upon the intersection of the whole width of the nave and transepts, German influence has confined it to the central aisle, which is perhaps more to be regretted than any other mistake in the building. The choir is neither a French chevet nor a German or Italian apse, but a compromise between the two, a French circlet of columns inclosed in a German polygonal termination.

This part of the building, with its simple form and three glorious windows, is perhaps an improvement on either of the models of which it is compounded.

This is the nearest approach to the French chevet arrangement to be found in all Italy. It is extremely rare to find in that country an aisle running round the choir, and opening into it, or with a circlet of aspidal chapels, which is so universal in France. The Italian church is not, in fact, derived from a combination of a circular Eastern church with the Western rectangular nave, but is a direct copy from the old Roman basilica.

The details of the interior of Milan are almost wholly German. The great capitals of the pillars with their niches and statues are the only compromise between the ordinary German form and the great, deep, ugly capitals—fragments, in fact, of classical entablatures—which disfigure the cathedrals of Florence and Bologna and so many other Italian churches. Had the ornamentation of these been carried up to the springing of the vault, they would have been unexceptional; as it is, with all their richness, their effect is unmeaning.

Externally, the appearance is very like that of St. Maria dei Fiori—the apse is rich, varied, and picturesque, and the central dome (excepting the details) similar, though on a smaller scale, to what I believe to have been the original design of the Florentine church. The nave is near as flat as at Florence, the clerestory not being visible; but the forest of pinnacles and flying-buttresses, and the richness of the ornamentation, go far to hide that defect. The façade was left unfinished, as was so often the case with the great churches of Italy.

Pellegrini was afterward employed to finish it, and a model of his design is still preserved. It is fortunate that his plan was not carried out. The façade was finished, as we now see it, from the design of Amati, by order of Napoleon. It is commonplace, as might be expected from its age, but inoffensive. The doorways are part of Pellegrini's design, and the mediæval forms being placed over those of the *cinque-cento* produce a strangely incongruous effect. For the west front several original designs are still preserved. One of these, with two small square towers at the angles, as at Vercelli and elsewhere, was no doubt the Italian design. The German one is preserved by Bassi. Had this been executed the façade would have been about one-third wider than that of Cologne. Had the height of the towers been in the same proportion they would have been the tallest in the world. In that case the effect here, as at Cologne, would have been to shorten and overpower the rest of the building to a painful extent. A design midway between the two, with spires rising to the same height as the central one, or about 360 feet, would perhaps have the happiest effect. At any rate, the want of some such features is greatly felt in the building as it stands.

To condense the above, we may sum it up as follows: The cathedral of Milan is the largest, richest, and most remarkable church of the Middle Ages, yet it is not satisfactory. Cause: The introduction of Italian features into a German church, or the admission of German ornament into an Italian structure. Is this originally a German or an Italian design? Its ground-plan is German, its section Italian. The latter is

improved by the German. The dome is too small. An Italian would have made it larger, and this is the greatest mistake. The choir is neither French nor German, but an improvement on either. The tabernacles surrounding the piers should have been carried up to the spring of the vaults of the nave. Could this be done?

Externally, the nave is not visible. Buttresses, pinnacles, and flying-buttresses hide that defect. The façade is commonplace, but inoffensive, The want of some sort of towers is here felt.

Kugler * says:

The corner-stone of the cathedral of Cologne was laid on 14th of August, 1248, and the work was subsequently delayed and reassumed toward the end of the thirteenth century, and the completed choir consecrated on the 27th September, 1322. The work then continued during the fourteenth century, but little was done in the fifteenth, and during the fore part of the sixteenth century it was entirely stopped. It is the work of many generations, and this is perceptible in the varying treatment of the different parts, yet the whole has the expression of an undeviating plan. We may perceive in its first conception the intent to create a structure which shall combine all the architectural results attained at that period. The design follows the example of the French system of cathedrals as developed during the fore part of the thirteenth century, and may be considered as the key-stone of that effort. What had been attained in the cathedral at Amiens, and what had already deteriorated in the church at Beauvais, we see here recovered with renewed force and raised to a new solution. This renewed effort betrays the fundamental elements of the French Gothic developed with that German art-force, based upon the rigid scheme (*strenge Zucht*) which is of the early Gothic architecture of the lower Rhine and the form-language (*Formsprache*) of the latest formation (*Gestaltung*) of

* History of Architecture by Franz Kugler, Stuttgart, 1859.

the German romantic architecture. In this structure is expressed the fullest earnestness, the most noble and elevated rhythm, a feeling for the most complete penetration of the problem of attaining a true architectural organism. As we advance with the progress of the building we perceive a rising effort in behalf of a clearer, more vital, and richer development. The later parts of the structure show a decided separation from the French school, an independent scheme of composition and formation.

The plan presents a nave with two aisles on each side of it, and a transept with one aisle on each side of its nave, a choir with a seven-sided apse, aisles and chapels surrounding it, and two towers at the west end fronting the aisles and inclosing a vestibule between them. The proportions are perfect, and in the arrangement of the choir and its surrounding chapels there is a firm rhythm, unequaled in any other structure belonging to this system.

The dimensions are of the largest, 450 (Roman) feet being the interior length, 150 (Roman) feet the width. The nave is fifty feet wide from centre to centre of the piers. The side aisles are one-half the width of the nave between the axes of piers. The total length of the transept is 250 (Roman) feet, and its width 100 (Roman) feet. The height of the nave is 150 (Roman) feet; that of the side aisles 65 (Roman) feet.

The master * (author) of the design is not known, in spite of many inquiries. After 1255 Gerhard von Rile(Rile, a village near Cologne, whence his father came) was known as the master and conductor (*Leiter*) of the building.

His services are mentioned in a document of the year 1257, conveying to him a considerable landed property. He presided over the building up to the year 1295, and he is supposed to be its first master. It is certain that the leading portions of the cathedral, the erection of which falls in that period, were executed under his direction, viz: the choir up to the triforium. He indicates in these the spirit in which are developed the early forms of the structure, being one of severity and simplicity. The piers of the interior have a circular nucleus, modelled with a view to

* It is well known that the mediæval architects were masters of the lodge over which they presided, a custom still prevalent among modern freemasons.

express the subsequent modelling and function of the vault. This modelling consists of shafts or beads of various sizes attached directly to the pier. This attachment has not reached a subsequent development whereby a connection is established between these circular members by intervening coves and narrow fillets. The bases of each pier arise from an unmodelled plinth, the transition passing through a series of polygons, yet the mouldings are still somewhat crude. The capitals consist of plain flat foliage, and the ribs of the central aisle rise directly out of these. They, as well as the main arches, have bottle mouldings separated by deep channels and fillets. In this method of modelling we must recognize a transition from the crude to a more fluent contour, which imparts to these ribs and arches an expression of elastic rigidity. The side windows are filled with rich tracery of the kind of those of the Ste. Chapelle of Paris, but of severer treatment.

The buttresses, calculated to resist the lateral pressure of the superstructure, are still treated as gigantic rock masses without artistic modelling.

The superstructure of the choir belongs to the second epoch of the building, which begins with the close of the thirteenth century, and continues up to the consecration, in the year 1322. Documents of the time mention as the then masters, Arnold (1295-1301), and his son John, (1301-1330), the latter of whom, like the first master, Gerhard, is mentioned by these documents with special recognition of merit and with distinction. This superstructure visibly consists of two parts denoting special progress: the main body of the clere-story, and the system of flying-buttresses which sustain its lateral pressure. The main walls are distinguished by their powerful fenestration filled with tracery of the most refined style, of noble and consistent lines. Below them, and included in the system, we find the triforium perfectly in accord with the windows above, both in their exterior and interior expression. Above, these windows are surmounted with traceried gables, rising above the roof and separated by elegant pinnacles, which also pierce the parapet of the roof.

Gigantic towering piers of cruciform ground-plan rise in storied peaks above the outer buttresses, and over the interior piers separating the aisles of the choir from the outer chapels. Deco-

rated with niches and tracery, gables and pinnacles, they present a characteristic contrast to the early simplicity of the buttresses of the lower story. The decoration of these, however, has not yet reached the final perfection which we see subsequently developed in the west front. It still adheres to the realistic dryness of the corresponding French modelling. The double buttresses of the choir, acting together as they do by reason of the arrangement of the ground-plan, and differently from those of the nave, which act separately, are still treated as isolated entities without being architecturally connected. Nor is the connection of the flying-buttresses with the main wall of the nave in all cases premeditated, but the abutment is effected not without detriment to the finished decorations of the nave walls. At the north of the choir the decoration of the buttresses is abridged, and the resulting powerful masses of this buttress system are not in accord with the elegance and grace of the fenestration ; the effort to raise this heavy structural organism to an ideally artistic one, which was the evident effort of the master here, cannot be pronounced to be successful.

A third epoch in the history of this monument is to be observed in the main nave. The beginning of this period may be placed at the end of the last; that is, the completion of the choir and the foundation of the nave doubtless still falls under the management of the master John mentioned above.

The execution betokens (*bekundet*) a new effort in the development of the system, one of progress in the main features, and of deterioration in those more extraneous. In the interior piers of the nave we see a greater vitality in developing the forms indicated in the piers of the choir. It consists of the same composition, but the cylindrical form of the nucleus of the piers is perceptible only exceptionally, the connection between the outer beads being effected almost universally by means of fillets and coves, the most concave part of the latter standing tangent with the circle of the main pier. The piers between the aisles are again of a new composition, well fitted to their subordinate position, and to equal functional action in all directions. They seem to be developed upon a square nucleus, which remains unimpaired in the channelling connecting the outer shafts, which are only eight in number, four principal columns supporting the

main arches, and four subordinate smaller columns supporting the ribs. This whole system of pier development must be recognized as belonging to the most refined examples of Gothic architecture. The bases and capitals are of the same force as the earliest members of this kind, but yet the mouldings are less sensitively treated, and the foliage betrays the mannerism of the later Gothic school. The ribs and arches are arranged and modelled like those of the choir, but betray a bloatedness which contrasts unfavorably with the severe rigidity of these.

The extrados of the main nave arches is decorated with a rising finial, and crockets leading up to the same in imitation of the exterior treatment of similar parts of structure, which must be accepted as a deterioration from the pure system manifested heretofore.

Finally, we reach the western façade. This consists of two towers, each of the width and corresponding with the two side aisles. Of this façade only the two lower stages of the south tower (up to the roof of the church), and but inconsiderable portions of the rest, were executed during the epoch of the mediæval structure; but the completed plan of the façade has come down to us unimpaired. It is a work of high and incomparable development, the master of which is, however, unknown.

If there was a completed plan at the beginning of the building, there is good reason to believe that it contemplated a similarly disposed powerful tower façade; but the system of building pursued at that time, and also the general condition of architecture (more especially of German architecture of the middle of the thirteenth century), leads to the conclusion that the designs of that time must have been of a more simple severity, and likewise of simpler masses, resembling probably the character of the façade of the church of St. Elizabeth of Marburg. In the design, as well as in the executed parts of the façade of the cathedral of Cologne, is manifested an unconditional and thorough system of a rising buttress architecture.

Powerful buttresses project on the corners and at the central piers, also easterly on the south-east and the north corners on both sides, covering the adjoining aisle windows, which fact alone is a proof of the unconditional peremptoriness of this buttress system; while in the central piers the buttresses are less massive.

The façade by this means is divided into five parts (corresponding with the interior division), the principal entrance door in the center of a powerful pointed window above the same, two windows being placed in each of the tower stories. In the tower openings, next to the main entrance porch, side porches are introduced, a somewhat striking arrangement, yet one perfectly consistent with the general system of the structure.

Higher up above the central part of the façade, appears the gable of the main roof, and above the wings (*Seitentheile**) rise the towers disengaged from the lower subdivision, with a central window flanked with lesser buttresses, a premonition of the subsequent octagon, while the pinnacles of the lower buttresses rise alongside in slender form.

The upper structure is entirely one of open-work, consisting of eight openings in each tower, with their intervening buttresses and their pinnacles crowned with bold gables and finials, and above this the spire, its corner piers united with tracery, decorated with crockets, and terminating in a finial some 532 feet above the church floor.

In continuous succession buttresses with their respective pinnacles detach themselves from the general mass, and shoot up so detached like the outer skin of a fruit or flower, out of which the main body of structure continues to grow with renewed vigor. There is in these masses (of the façade), and in their detail, a visible pulsation of life which greatly contrasts with the unmodelled, heavy masses of the side buttresses.

From the very bottom they are decorated with tracery and slender niches, which in their modelling betray the masses they decorate.† The same system is pursued in the fenestration, in the rich tracery of which we perceive new modifications of those of the choir, as we also do in the modelling of the jambs in the gables, pinnacles, and the traversing horizontal cornices. The whole is pervaded by a uniform rhythm, and this variety of modelling is the outcome of one fundamental law, a visible artistic premeditation.

It should be stated, however, that the total expression of this

* Meaning the two lower stories of the towers.

† This may be questioned in the light of the previous analysis of the use of tracery as a method to express the vigor of wall-masses.

production, in spite of its logical reasoning and unconditional sequence, conveys an idea of rigidity which leads to the conclusion that it falls somewhat short of full and expressive (*klarer*) dignity.

The central part of the façade seems compressed between the two powerful towers. The arrangement of the three portals serves in one way to relieve this defect, but it also tends in another to draw attention to it, and the tautology of forms accruing from the insertion of the gables of the side doors into the face of the tower windows is not beautiful.

The open spires, like all works of this kind, perform the function of a playful, fantastic, decorative feature, yet, with their gigantic dimensions, it will be difficult to overlook their material weight, and their emphasized sobriety is far removed from the naïve, playful movement probably attempted.

The interior of this frontal structure is treated as a great hall, the central portion of which rises to the height of the nave, while the tower part is divided into stories, arranged with massive piers and broad arches. The mouldings of these arches and ribs run down to the bases of the piers—there are no capitals. This element corresponds with the Gothic art of the Rhine as prevalent about the year 1400. The sculptured decorations of the south portal belong to the same epoch, while the detail of the exterior is decidedly in the character of the work of the early portion of the fourteenth century.

We may conclude, therefore, that a considerable time elapsed between the designing and the execution of the façade, and this assumption is further confirmed by the existence of isolated variations, from the original designs, which bear the impress of a later period. Of these may be mentioned various tabernacles prescribed by the original design in the second story of the main buttresses (a reminiscence of an earlier development, as exemplified in the cathedral of Strasburg), which in the execution are entirely omitted, and for which are substituted panels of tracery gabled and pinnacled, which belong to the more rigid school of a later period. The design of the façade may, therefore, be placed at a period immediately succeeding the completion of the choir, say the second quarter of the fourteenth century.

The vestry-room, adjoining the north side of the choir, is a

square structure of considerable magnitude, containing a central pier, the mouldings of which continue into the arches and ribs, but are possessed of capitals. Some important parts of the structure were discovered during the epoch of the old part of the building. It is possible that no thoroughly digested plan existed by which they could have been executed. These are mainly the façades of the transepts. Foundations and bases of the same existed in the façade of the north transept; they were of less elegant modelling than other parts of the building, and belong to a defective effort to continue the work, somewhere toward the close of the Middle Ages.

The present side walls, and mainly the splendid south side elevation, are the work of Zwirner, under whose direction the building of the cathedral has been recently continued in a manner fully in accord with its original art system. Nor was anything found among the original drawings to show how the intersection of the transepts was to be terminated; but as the nature of the transept piers did not indicate a heavy central tower, an iron turret of the least possible weight is contemplated.

The essence of the foregoing criticism of the cathedral of Cologne goes to show that its early architect had mastered the best French works preceding his time, and had with judgment selected the choir of Amiens for the starting-point of his effort. He does not inquire whether it is French or German, but accepts his model as the best attainment of the times, rejecting with discrimination subsequent efforts like that of Beauvais, for instance, as decadent.

Nor is he content merely to copy what seems to him the most perfect production of the past, but he develops his structure on that basis in obedience to a more rigid system of applied construction in art with unparalleled success, yet not without partial failure.

His successor, who designed the façade, is guided by the same principle, and is rewarded with more

brilliant results (with results never in their fullness attained before or since), yet not without several notable shortcomings which are described with scholarly exactness. The author discovers the progress and decline of the modelling of the interior piers, arches, and ribs, and presents the history of this art progress with a technical skill which betrays thorough familiarity with construction as a science, and a knowledge of its intimate relation to art expression.

Let us see what Kugler says of the cathedral of Milan:

Deviating from the style of Italian Gothic is the cathedral of Milan. It was founded in 1386, and completed but recently, after many vicissitudes of progress. Yet, some few details excepted, it presents a whole of homogeneous cast. It is a work of northern planning, not without modifications dictated by southern feeling.

The complicated history of the building shows frequently, and in important places, the names of German masters; and one of these, Heinrich von Gemunden, is accepted to have been its original designer. At any rate the fundamental features of the design, and the executed work, point to the late Gothic of Germany, and the most characteristic features of its detail to a similar relation, more especially to that Bohemian and Suabian school whose principal work is the cathedral at Prague, the masters of which monument came from the city of Gemünd. The cathedral of Milan is distinguished by its colossal dimensions, its splendid material (white marble throughout), and by the clearness of its arrangement, and also by the multiplicity of its ornamental decoration.

The total effect is one of majesty, of a powerful copiousness; but thorough development is lacking, the same as in the German works of the school which has here exercised the most potent influence; and the modification of the northern system to adapt it to southern wants tends here to a further bar to artistic development. The ground-plan is perfectly regular; it is a five-aisled

longitudinal structure, traversed by a three-aisled transept, which transept terminates at either end with a small three-sided apse. The choir has three aisles (with vestry rooms on either side, which arrangement measurably continues the five-aisled organism of the longitudinal structure), and is a three-sided apse, with a parallel aisle all around it. The aisles are of considerable height, and rise above each other in but moderate dimensions. At the intersection of the nave and transepts there is a dome of greater height than the nave, which dome terminates on the outside with a steeple. There is no real tower anywhere, probably in deference to the general southern custom. The dimensions are: interior length, 448 feet 6 inches; total width of aisles, 175 feet 6 inches; nave, 52 feet 4 inches, with a height of 147 feet 9 inches; height of aisles next to nave, 97 feet, and height of outer aisles, 75 feet; height of dome, 201 feet 6 inches; height of cupola outside, 339 feet 6 inches. The interior system shows everywhere modelled piers, the modelling consisting of eight pear-shaped mouldings of the not beautiful characteristic forms of the Bohemio-Suabian school. In place of capitals the interior piers terminate in a high decorative tabernacle structure. This splendid structure, however, interrupts the continuity of the development of the piers in its transition toward the vaulting, and the clustered columns carrying the vault ribs rise out of this tabernacle structure. Even more faulty is the corresponding arrangement of the piers separating the side aisles, where, by reason of the unequal height of the spring of the arches, only one half of the pier retains this tabernacle structure, while the other half is treated somewhat lower down with a capital of ordinary dimensions, an arrangement detrimental to unity of expression. The clere-story walls are but of inconsiderable height. They are pierced with small pointed windows, which, by reason of their insignificant dimensions, bear no reasonable relation to the large mass of wall width. Circular or equilateral windows would have been much more appropriate. All these defects arise from the low elevation of aisle above aisle, from an unusually low clere-story wall, for the treatment of which no precedent existed, and from the lack of courage or skill on the part of the architect to devise such a treatment.

As for the general effect, however, it does not suffer much

from this cause. The great height of the aisles and their near approach to equality of altitude gives prominence to the colonnade supporting the vaults, and leads the eye toward the sides, where the light enters through the great windows of the side aisles; and the force of the tabernacle structures which crown the piers, and thereby interrupt the structural upward motion, tends to confirm this effect. There is an incongruity in this peculiar system, yet its effect is not sufficiently intrusive to make it prominent and decisive.

The side windows throughout are filled with splendid tracery, the design of which is most perfect in the windows of the choir. The external surfaces of the walls, as well as those of the moderately projecting buttresses, are covered with tracery, crowned with neat gables at the eaves of the structure.

Round about the building elegant pinnacles shoot up above the cornice, and neatly decorated flying-buttresses bridge over the somewhat flat aisle roofs. The transept tower starts from the lantern of the cupola. It is very slender, and is surrounded with pinnacles at the foot.

The total expression of the exterior, in its elegantly decorated masses and abundance of frail pointed projections upward, is wonderful and fantastic.

Only the façade, although not without munificent decorations, is inferior to this effect of the rest of the work. It is of the form usual in Lombardi, of a broad homogeneous mass divided superficially into five parts. The fenestration in arrangement and form is pretty and mixed with forms foreign to the spirit of the structure. It is executed after the design of Pellegrino Tibaldi, who superintended the building subsequent to 1570.

A criticism of these two works of architectural art, referring to the idea, acts, emotions, material, and knowledge of construction of the time, as well as to a further knowledge of the æsthetic expression of the construction, with a view to elicit the art force manifested in these monuments, should be ordered somewhat as follows:

We may assume that the idea of religion, as held by

the Catholic Church during the thirteenth century, had undergone no material change during the succeeding hundred and fifty years; that, furthermore, the acts of the Church, to illustrate this idea, and the resulting groupings and emotions, remained essentially the same.

If the technical means and methods had not been increased, they certainly had not been diminished; but whether they were clearly understood by the architects of the cathedrals of Cologne and Milan is a proper subject of inquiry. But the most important question in the interest of art to be answered by a comparison of the cathedrals of Cologne and Milan is to what degree these structures indicate a logical æsthetic development and expression of structural masses, and to what extent they manifest progress or decay in this direction.

To understand more clearly the probable views of the author of the cathedral of Milan, at least the impressions which may have influenced his mind in the design of his work, it will be well to glance over the changes which Gothic architecture had undergone during the century intervening between the conception of Cologne and the latter part of the fourteenth century, more especially in the Eastern German school of Bohemia and Suabia, of which Kugler says Heinrich von Gemunden was a pupil.

This school mainly distinguished itself for its revolt against conventional structural transitions which had been heretofore, and have since again, been held in high estimation, viz.: the moulded base and the capital.

An early abandonment of the capital may be found in Cologne itself. The moulding of the interior piers of the Western structure (including the towers and vestibule) continues through the arches without the

intervention of a capital or any other feature of transition. The result is not favorable to art expression, for the reason that the value of force and elegance demanded in the modelling of the arches cannot possibly be the same as that of the modelling of the piers. In the language of taste and feeling, the effect is stringy and weak, meaning that it is inconsistent with function, and lacking an emphatic designation of a change of function which occurs at the spring of the arch. This feeling resulted subsequently not in a restoration of the capital and a judicious modelling of the piers and arches, but in the entire abandonment of all modelling of the piers.

A circular or octagonal ground-plan was adopted, and the arch mouldings were allowed to grow directly out of these circular or octagonal piers. This doubtless was a gain in giving expression and force to the pier by simplifying its form, nor can the lack of a feature to mark the point of transition be entirely condemned, but it imparted to the whole organism an air of naturalness transcending the conventional nature of bonded masonry. The bases also passed through several stages of stalactitic modelling which, by its variety, novelty, and ingenious complication, pleased its authors, but was finally abandoned, and the piers were permitted to grow directly out of the church floor without any member indicating constructive expansion at the foot. The intersection of beads and bottle mouldings is also an invention of this school. To sum up the mental condition which suggested these novelties, we may accept it to be a state of dissatisfaction with existing methods, and the inability to assign the true cause for this dis-

satisfaction; hence, a want of success in attempted remedies.

The principal act of the Catholic Church, or, as it is called in the technical language of that church, the performance of the service (mainly the mass), is in the cathedral represented by the cell known as the choir, the chevet, or the chancel. The choir occupied the whole eastern part of the cathedral immediately adjoining to and beyond the transept.

The scheme of dividing the body of the cathedral into nave and aisles may be traced to a desire to light the body of the church through the clere-story, both by the physical necessity of the case—the light being practically needed—and also for the æsthetic illumination to be attained in this way.

In fact the nave, transept (its nave), and choir (here also the central part, which continues the longitudinal nave is meant) constituted the main nucleus of the interior structure. The aisles were added not for the purpose of accommodating the congregation so much as to serve for a reasonable and convenient passage around the central functional part of the edifice (the nave) by the congregation, and by visitors, also for the habitual processions of the clergy, as is indicated more forcibly by the German term attached to these aisles (*der Umgang*, the surrounding passage), as well as for the æsthetic purpose of extending the vista beyond the limited boundaries of the nave.

In spite of a current prejudice of our own time, which finds constant expression in stigmatizing mediæval churches as dark and gloomy, the cathedral is the best lighted and most abundantly lighted structure ever erected by man.

The most brilliant result of this method of lighting through a clere-story is to be found in the conception of the transept, by means of which a great flood of light from the south is introduced, and plays the part of receding the choir in its perspective, and subduing it by contrast with its own brilliancy and abundance of illumination, setting it back as it were into a dim mysterious distance.

This scenic effect may not have been the sole motive —perhaps it may not have been the motive at all— for the introduction of the transept, yet it was its result; and, as a happy result even of an accidental arrangement (if any one should choose to look upon it in that light), it must have been known to mediæval architects.

A cursory glance over the ground-plan of the cathedral of Milan will show that the advantages of this feature were either not known or entirely overlooked by its author. The choir is too short for the performance of the service, and the area devoted to this purpose is actually extended into the transept, and the choir is moreover the best lighted part of the church; hence it is brought forward toward the nave, to the detriment of perspective and of the expression of interior depth. In fact, the system of lighting the interior through a clere-story is virtually abandoned. The clere-story windows are so small and insignificant that their existence is not practically or æsthetically of any value whatever.

A structural development like that of St. Stephen's at Vienna would have been more consistent with the ultimate result, and infinitely more favorable to the roof construction, in which a marble roof is supported

by a barrel vault resting upon the clere-story walls. The lateral strain of this extraordinary load is not concentrated upon the buttresses, nor is it considered in the arrangement or in the magnitude of these buttresses and their adjuncts; hence the necessity for the iron rods which are used as auxiliaries to the abutment, an expedient unworthy of the magnitude, importance, and splendor of the monument. We observe here an almost total obliviousness of the constructive attainments of the past, and a striking impotence in meeting the necessities of the stone roof—a problem, the solution of which was amply contained in the possibilities of the buttress system actually applied. If we compare the art force displayed in the conception of Milan with the art force manifested in Cologne, we are struck with the conscientious effort shown in the latter to hold fast the attainment of the past, in selecting the choir of Amiens as a starting-point of operations, and to improve the modelling of structural parts in the light of a clear conception of their constructive meaning.

The attempt of the architect of Cologne is not one to do something novel, striking, odd, or gorgeous, but to do all that is made possible by past experience, to do this as well as it had been done heretofore, to avoid past errors, and, if possible, to refer all forms, old or new, to established and clearly understood constructive principles.

This is not meant to reflect upon the architect of Milan, for in those days knowledge existed more or less as a tradition merely, and a century of practical deterioration in art may be accepted as a valid excuse for the deterioration of the individual architect, but

the analysis of a monument is concerned with the art force displayed in it, and not with the artist who designed it.

When we examine the treatment of structural parts in Milan, we are struck first with the fact that the piers are modelled all around with a uniform pear-shaped moulding. The pier is treated as a unit of equal structural function in all directions. This is inconsistent with the facts in the case. In the dome of Cologne the nave piers measure 6′–5½″ in the direction of the nave axis, and seven feet in a line perpendicular to the same, while the piers separating the aisles measure 5′–9½″, and the corner piers at the intersection of the nave and transepts measure 8′–11″ respectively, in both directions. Again, the main arches of the clere-story walls are represented in the pier by three shafts, the central one measuring 1′–4″ in diameter, flanked on each side with a shaft of 6½ inches in diameter, while the minor arches rest upon a single shaft, also 1′–4″ in diameter. The ribs are supported by shafts 7½ inches in diameter. All this shows reflection and reference to function. The perpendicular weights of the arches and ribs may, it is true, be collected upon one unmodelled shaft, circular, square, or octagonal in form, without violence to artistic expression. The pier may, by such a treatment, lose force or elegance of expression, and yet express fully the mechanical work performed; but if such a pier is modelled at all, the arrangement, relative magnitude, and form of the mouldings must respond to the mechanical work performed at the point where this special modelling is done. There is another way to consider this subject. Modelling of a structural mass has for

its object an expression greater, more emphatic, or more phonetic in its character than the expression of strength, elegance, stability, and function which could be conveyed by the crude mass alone. It follows, therefore, that variety of function in the crude mass must be expressed by variety and magnitude in the modelled forms. If this is not done, it proves clearly that the architect has not mastered an elementary principle of æsthetics. If it is not well done, it shows either ignorance of the mechanical functions involved—perhaps an imperfect knowledge of the relative magnitude of these functions—or, finally, an inability to express the value of the respective functions in corresponding modelled members.

The architect of the cathedral of Milan shows in his work that he intended a simple circular pier to do the work imposed upon it; that he deemed such a pier not insufficient in expression, but insufficient in variety of form; he thought it necessary to decorate the pier, but did not know that decoration or modelling has for its purpose a more detailed and emphasized explanation of the functions performed; hence he ranged a series of unmeaning pear-shaped mouldings symmetrically around the circular nucleus of his pier. These pear-shaped mouldings are unmeaning when applied to a pier; they are not unmeaning, however, when applied to an arch, where, when bent in the form of an arch, they express an elastic rigidity which cannot be approached by any other known moulding.

This same imperfect knowledge of functional meaning is displayed in the use of the above-mentioned tabernacle structures, which are evidently intended to cover the junction of the arch mouldings of the

vault and clere-story wall with the mouldings of the piers.

Tabernacles may be placed almost anywhere upon a structure, always provided they do not interfere with the action of a functional part. The shaft or the wall-face upon which they are built must visibly continue behind them. The south transept pier of the cathedral of Strasburg, the modelling of which is credited to the daughter of its architect, is a notable illustration of this principle.

A tabernacle cannot itself serve as a structural transition, like a capital or a bracket; whether the architect of Milan intended his tabernacles to serve as a substitute for capitals or not, we cannot now clearly determine; it is probable, however, that he entertained an indistinct notion that the introduction of the tabernacles in the place where we find them was sufficient to conceal a structural part by an extraneous ornamental one, which is a radical architectural heresy.

The vaults of Milan cathedral are of the crudest nature; with the exception of slight lunettes over the clere-story windows, they are nothing more than barrel-vaults. This defect is so strongly felt, that a decoration consisting in a scenic painting of a vaulting system (filled with tracery in place of the plain capping) has been introduced. This is the most glaring decorative deception ever attempted in a mediæval Gothic structure.

The reasons have been stated in the last chapter why an imitation of the mullions and tracery of a window cannot be applied to the modelling of the face of a wall, or at least, why a system of modelling involving the forms of mullions and tracery, when applied to the

surface of a wall mass, does not add to, but rather detracts from, the functional expression of such a mass. The exterior of Cologne, and more especially that of its western front, demonstrates how much expression can be imparted to a structure by ingenious changes of method and a judicious distribution of enrichment, even under the guidance of a system intrinsically false; but Milan demonstrates, by the flimsiness and uniformity of the tracery of its exterior, a perfect want of intention to express differences of mechanical function. It is a mere attempt at decoration without meaning, and is a success at that. It fairly resembles the frosting of a cake, and were it not for the extreme whiteness of the material, which, under the influence of certain methods of lighting, more especially of moonlight, imparts to the structure a sort of semi-translucency, which is heightened by this veil of tracery, it could not fail to strike observers as painfully trifling in effect.

Both Mr. Fergusson and Mr. Kugler, kindly express a sort of contented resignation in the face of the injudicious lighting of the dome of Milan, no light being admitted at the top and in the centre of the structure, from the windows of the clere-story, and too much light entering from below through the side windows, remarking that this circumstance imparts to the monument the interesting appearance of a hall (*Halle*), a colonnaded space. This fact may redeem the monument as a structure, but it cannot redeem it as a church, the purpose of which always must be to serve a congregation of persons as a place of worship, not as a temporary transitory passage to another part of a structure where they finally intend to abide.

The abrupt transition from the lantern to the turret or steeple surmounting it demands a constructive explanation of the stability of the latter which is not rendered in the inverted flying-buttresses, which are evidently designed to answer that purpose. It tells the story of a sudden conviction that the continuance of an octagonal tower, heretofore contemplated, must be abandoned by reason of the insufficiency of the piers supporting it, and the artist, abhorring the nakedness of a roof, beats an undignified æsthetic retreat under cover of an insignificant steeple, sustained by impossible flying-buttresses, resting upon insufficient abutments.

There is in Milan no feature more significant of the mechanical and artistic shortcomings of its author than this that the transept piers are of the same size and form as the other piers of the nave. Even if no central tower—if no central cupola—had been contemplated in the original design, the exigencies of the structure, without these subsequent additions, demand a difference in the size and modelling of these piers, as we find it in Cologne and in many other contemporary churches.

We may close with the words of Burckhardt:

"The cathedral of Milan is an instructive example which teaches the distinction between an artistic and a fantastic impression. The latter may be enjoyed here without stint; a translucent marble mountain, imported from the quarries of Oranavasco, magnificent by day and fairy-like by moonlight; without and within loaded with sculpture and painted glass; rich in historic reminiscences of endless variety—a whole, the like of which the world has nothing to show. But

he who is in search of ideas embodied in material forms, and who knows of the designs which have never been carried into execution, while the Duomo of Milan was completed by the sacrifice of gigantic means, cannot contemplate this structure without pain."

CHAPTER XXVII.

THE CULTIVATION OF ARCHITECTURE.

The cultivation of architecture is made difficult in the outset by the errors and prejudices which surround the subject, and which must be discarded before the mind of the student can be sufficiently receptive of the truths and principles involved. Architecture, as understood at present, cannot be said to rest upon a scientific or logical basis. It is at best but a heterogeneous collection of empirical formulæ, which tend to mislead rather than to instruct.

Knowledge is derived from phenomena (matter and its motion). We see and hear what is going on around us, and from this sensuous perception we learn. But as matter appears to us in diversified forms, and is subject to equally diversified motions, and as our senses furnish but imperfect means of perception, it is the function of science to classify phenomena with relation to the causes by which they are produced, and to guard the inquiry at every step against errors of sensuous perception.

Architecture deals with forms classified chronologically, but not under any system which involves their causes, or the principles upon which they have been developed, or the ideas which they represent. If the student of mechanical engineering were sent into the

world to examine machines as he finds them in operation, or depicted in books, with no other guide than the dates of their construction, with directions to select those which seem to him useful, without being informed beforehand of the principles of mechanics, the nature of the lever, the inclined plane, the cog-wheel, the pulley, and the application of these elements of machinery to mechanical work, the result would be that mechanical engineers would select machines to please their own fancy or that of their clients—machines which answer the purpose indifferently, or perhaps not at all—and, also, that no new machines would be created. This is precisely the condition under which the student of architecture pursues a knowledge of art, and this is the sort of judgment by which he applies art forms. He examines the *répertoire* of past completed art forms, and selects from these what may please his fancy or that of his client.

The student of architecture believes at the outset that he is possessed of *taste* for the art, which is the first and greatest hindrance to the study of architecture, and no progress is possible until this radical error is corrected.

Taste, in one of the senses in which it is used, means a love for practical architecture, or, in other words, the candidate for a professional career thinks that he would prefer to be an architect rather than a lawyer, a clergyman, an engineer, or a physician. The causes of this preference are numerous. They are rarely to be found in a knowledge of the true import of these various professional vocations, nor of the training they demand. Most frequently the reason for this love of architecture is somewhat like this: Architecture is an

art, and therefore a matter of taste. Taste is supplied by bountiful Nature. Hence, there is no need of a long course of theoretical training. Architectural art may be acquired in the office of a practicing architect, where, the daily work being done, one is not subject to periodical examinations, which are a bore. The profession is not supposed to be as precarious in its financial results as painting or sculpture, for structures of some kind are an absolute necessity, and if one cannot attain to the building of monuments, he may well content himself with erecting dwellings, warehouses, hotels, and the like.

A clear comprehension of the technical studies which the architect must master would materially reduce the number of our students. On the continent of Europe, where these studies are obligatory, the number of aspirants is much smaller than in England and the United States, where a man may set up as an architect, and be received as such by the community, without any preparation whatever. In the next place, taste is imagined to mean a sound judgment implanted by nature in the human mind, which enables one to distinguish bad from good art wherever he finds it, including, of course, his own compositions on paper. Were this true, how would taste help the composition of organisms of any kind, beyond condemning them when they appear bad? Taste, at best, could merely be a protection against bad work, and not a guide to good work. To compose organisms, we need some knowledge of the idea to be expressed, of the natural laws pertaining to matter and its relation in organic combination, to the end that it may perform given functions. No amount of taste can supply the place of this knowledge.

The fallacy of all this has been shown in previous chapters, and it only needs here to be stated that when a person at the time he is choosing a professional career suspects himself of natural taste, with a strong belief that this taste alone will make him an artist, the shortest road to success in life is to avoid art entirely, and to select a science, trade, or mercantile pursuit—anything but art.

The next serious error of the modern architect is, that immediate popular approval is the only test of the excellence of his work. He carries this belief so far, as to reject in practice th e use of all architectural forms which have not been popularly approved.

If it is remembered that architecture is the expression of ideas, and therefore a method of instruction, it follows that its forms can be popular only when the ideas conveyed are generally understood. A desire for immediate recognition, therefore, of the merits of architecture must become subversive of progress in that art. But even in cases where the idea to be expressed is popularly accepted as true, the architect fails to represent it in his monuments, for fear that the forms expressing it will not please his patrons. This is mainly owing to the fact that the modern architect and the public both imagine architectural forms to be independent of ideas. The relation between the idea and the form has been so long neglected that the idea has now ceased to be the essence and cause of forms. The forms themselves are supposed to possess the quality of exciting pleasure for reasons not defined but imagined to be concealed in the inspirations of individual taste. Hence, the erroneous belief that the only test of their art value is in their popular acceptance.

Another popular error shared by many architects is, that the general effect produced by an architectural drawing is a criterion of the merit of the monument which this drawing represents. While the architect is composing a monument, he is assisted in the process by notes in the form of geometrical drawings, which notes help him to keep in mind the relationship of parts of his structure, to fix in permanent form what is determined upon, and hence to advance to what remains to be thought out. These geometrical drawings, unfortunately, bear a certain semblance to the completed structure, which semblance is supposed to convey an intelligible idea of the monument it signifies. That this is not the case may be shown in various ways. Let us consider, first, the most superficial characteristic of these drawings, the manner of their execution, and we find, by practical experience, that all drawings executed differently from the prevailing practice fail to convey correct impressions of intrinsic art merit, as for instance, the original designs of mediæval work still extant and old engravings of the Renaissance period; the former, because they are indifferent pen-and-ink drawings when compared with modern work of a similar kind, and the latter, because they are superb line engravings, treated in a more rigid style than the drawings of the present day. Neither of these convey to us promptly a precise idea of the excellence of the monuments which they represent. Badly executed drawings, moreover, often represent superior architectural monuments, while other drawings, artistically or elaborately executed, are merely notes of ill-digested ideas and of bad construction. Yet, the immediate impression made upon the

architect is affected by the technical excellence or the defects of execution, while a just appreciation of the intended monument which they represent is acquired only after a close and long-continued critical examination and analysis of architectural drawings. All architects are familiar with the importance of what is known as depth in the modelling of masses, yet geometrical drawings convey no idea of this important element; we have to search for it in sections where, again, it is not so represented as to show its true import without resorting to actual measurement and the forming of a picture of its results in our mind. A geometrical drawing represents every point of a structure as it appears on a level with the eye; the completed building, on the other hand, presents different values for different levels, which, to be correctly understood, must be estimated.

No architectural drawing conveys an idea of the manner, method, or efficiency of a system of lighting of the interior of a structure. We cannot tell by merely looking at an architectural design whether an interior will be ill or well lighted, nor whether the bulk of the light represented will be so distributed as to serve physical needs or subserve æsthetic demands.

It appears from the foregoing, therefore, that an architectural drawing contains but slight indications of the nature of the monument which it is intended to represent, and that the leading elements which constitute good architecture, while they may be detected in such a drawing by skillful analysis, are not directly apparent. Something, however, that relates to the building is still visible, and this tends to mislead rather than to instruct, for the simple reason that the draw-

ings of it are not equal, in their magnitude, to that of the structure itself, but are prepared upon a reduced scale. It has been shown in a previous chapter that architectural masses do not increase in a geometrical ratio with the magnitude of a monument, but in accordance with certain mechanical laws which prescribe various ratios; it follows, therefore, that the drawing of a monument reduced in scale, which means one-half, one-quarter, one-tenth, or one-twelfth of the actual size of the monument, conveys the idea of exaggerated supports to apparent loads, and, hence, is no correct picture of the relation of its masses. A perspective view, although better adapted to convey ideas of depth than a geometrical drawing, also partakes of these defects, and is, therefore, to be rejected as a fair representation of the æsthetic expression of a monument.

In truth, the architect who does not in his composition constantly revert to the actual structure by analysis and reference to laws of construction, but who permits himself to be led by the effect of his drawing as it grows under his hand, and who is willing to accept impressions from it alone as a guide in design, must fail in the result of his art efforts.

When we consider the inefficacy of architectural drawings to convey a correct or even an approximate idea of an intended monument to an experienced architect, it seems truly preposterous for a layman to attempt to judge of architecture from mere drawings, and this attempt is most detrimental to the cultivation of the art in modern practice.

The reputation of an architect, the art displayed in his executed works, should be sufficient for patrons of

architecture in selecting professional aid, the same as it is in all other professional employments. If the layman cannot judge of the probable merit of an architect's future work, from the work he has done in the past, how is he to do so from a design? No one presumes to judge of the ability of a lawyer from his briefs, or of that of a physician from his prescriptions. The architect alone is expected to submit designs to the approval of laymen, who do not understand the nature of those designs, but who think that they do, because of the accidental resemblance of these designs to the monuments to which they refer.

Next to the delusion that all men are endowed with taste which enables them to judge in matters of art, the practice of submitting architectural designs to the approval of laymen, which has partially grown out of this error, has become a hindrance to the development of architecture. We find a parallel to architectural drawing in those of mechanical engineering and ship-building. Technical drawings here likewise bear a semblance to the objects they relate to. No man not versed in the science of mechanics or in marine architecture will judge of the merit of such designs from drawings, more especially when a material interest may be injured by defective judgment. Yet the scientific principles involved in the consideration of the static relation of matter in an architectural monument are much more obscure and inaccessible to the unprofessional mind than the laws relating to the dynamics of a machine. The relation of scientific construction to æsthetic expression, the constructive significance of modelling, of carved decoration, and of the application of color to parts of structure, are mat-

ters which are but little understood, or even regarded, by persons outside of the profession, and it is but just to admit that these things are not even generally understood by the professional architect. Finally, the organization of a monument, the arrangement and mechanical connection of its single cells, the selection of fitting constructive methods to express given emotions, are matters which affect architectural designs not only in the ultimate appearance of the elevations and sections, but in the fundamental arrangement of the ground-plans, all of which is often overlooked by the architect, and rarely ever considered by a non-professional man. In fact, the examination by laymen, of an architectural design is almost universally confined to those qualities of it which relate to the gratification of the physical demands made upon the structure, to a proper economy of space, material, and labor, and to the matter of beauty only so far as the general appearance of the design seems to promise it, and these promises we have learned to recognize as delusive. The notion that an architectural design in its organic features contemplates physical necessities only, and that its beauty is something afterward superficially added, seems to be universal with laymen, and serves them as a recognized principle in all building enterprises. It is a common practice throughout the civilized world to invite architects to prepare designs subject to the examination of persons who are in charge of building enterprises, and who determine the employment of an architect with sole reference to their judgment of the merit of the designs submitted. The fact that important and costly building enterprises are thus initiated clearly shows that the persons

intrusted with them are willing to assume responsibilities involving professional intelligence of a high order, for it is more difficult to analyze correctly a completed design than to prepare one. The most superficial knowledge of the subject forbids such a proceeding; it imperils the best interests of the scheme in the outset.

This is not the place to speak in detail of the demoralizing results of this practice. They have been often discussed and are pretty well known, at least to the profession. We may regret, however, that architects who are able to render solid service to society should submit to this system, and thereby sacrifice the best interests of their art. No other professional man but the architect consents to submit schemes of his work in competition. He alone volunteers this degrading service, to the great injury of his personal interests, his fair standing in society, his independence, and his art. A few men who lead the profession in the principal cities of the world only need to say that they will discontinue this practice in order to put an end to it.

There is among architects and amateurs a world of talk about feeling, proportion, harmony, unity, and picturesqueness, which should be abandoned at once, unless it can be defined to mean some tangible relation of structural elements. It is the language of the mountebank or the dupe, and, to the credit of the profession, it may be stated that it is most frequently the latter. The amount of ecstasy which is extracted from these windy elements by enthusiastic students is really marvelous. An art-work is the outcome of sound logical reasoning, of long-continued study, of technical

knowledge, of much labor, of close application and industry, and, above all, the outcome of cool head and strong nerves, which enable the artist at every step to recur to his knowledge of the subject, or to search for knowledge where deficient. Undue enthusiasm, which means unbalanced nervous action, feeling and sentiment, which mean prejudice and unguarded judgment, are seriously detrimental in the pursuit of fine art. Feeling and enthusiasm in the aspiring artist are useful only as incentives to labor.

Let it be remembered that the wonderful art effects produced upon the stage by great dramatic actors and actresses are methods of motion and recital carefully practiced in accordance with the teaching of some master, who himself is rarely a performer, but who has studied the author and carefully interpreted his meaning; who has determined the acts which illustrate his ideas, and framed them into living pictures by depicting the emotions which are the results of these acts. To accomplish this end the actor must commit his part to memory. If his mind is occupied by listening attentively to the prompter, he cannot perform with that freedom of action which is desirable. As to what is vulgarly known as stage business, the moving about from place to place, it must be purely the result of study; if two or more actors were left to the promptings of their own intelligence and feeling as to their position, there would be no concert of action, and all would be confusion and discord. It is clear, therefore, that the great bulk of artistic performance is the result of technical knowledge, technical study and labor, and a very small part of personal feeling and enthusiasm, and that this small part is expended in the apprecia-

tion of prescribed and predetermined emotions, and in studied methods of rendering them. It cannot be otherwise, for art is the premeditated representation of an idea in matter, and the process of premeditated action of any kind means knowledge, technical skill, study and labor first and foremost. The understanding of the emotions involved, to be efficient, must also not be the mere result of feeling and sentiment, but in great part that of logical analysis.

A musical composition and performance will illustrate this perhaps more clearly. The musical performer, before he can render music by his instrument, must first be a perfect machine. He must be correct in rendering the score before he can attempt to play with feeling; he must have mastered the technic of manipulation before he can succeed in rendering the score. If he further desires to compose music, he must acquire a theoretical if not a practical knowledge of the technic and capabilities of every instrument that is used in an orchestra. He must then master the theory of composition, which is mainly mathematical. To render religious, patriotic, or social ideas in music, he must be familiar with these ideas as they appear in history or in poetry. Thus the process of composing and performing music is made up of a vast amount of theoretical and technical knowledge and of technical skill which is the result of practice, of long years of untiring industry. The musician must be possessed of feeling also. There are delicate shades of rendering musical compositions which no score can convey. But to understand the nature of these, and to render them successfully, great technical knowledge and skill are again indispensable. Let us imagine a number of

musical enthusiasts, men who go into convulsions at a discord, and talk critically of the opera and the oratorio, but who have no technical knowledge of music, attempting to perform an overture. All the feeling and enthusiasm in the world will not enable them to do so.

Something very near akin to this is done practically in architecture, and has been so done since the end of the thirteenth century, when architecture ceased to be a living art. Hordes of enthusiasts, ignorant or intentionally oblivious of the knowledge which governs the creation of architectural monuments, have been let loose upon society, possessed with the idea that their feeling, sentiment, and taste suffice for the composition of architectural work. It is not surprising, therefore, that architecture is now in the chaotic state in which we find it, a ship without sails or compass expected to reach a safe harbor by the sole efforts of the man at the helm.

What should be impressed on the mind of the architect is that architectural forms, like all art organisms, and like the organisms of nature, are the result of environments. His efforts must be mainly directed to his own equation, that he himself may not become a detrimental environment in the process of artistic creation by either misunderstanding the nature of environments, or by ignoring them, or by a failure to respond to them promptly, effectually, and, if possible, skillfully. It is not the function of the architect to produce effects; he should permit effects to be produced by the organism he creates. He cannot judge of the effects, which should be the final result of an organism, before the organism is complete. The relation of the architectural monument, so far as its architect is concerned, is to

the idea only which is to be expressed in matter. The effect is the result of this relation; of which the idea is the hypothesis, its relation to material and construction is the argument, and the effect the conclusion, which cannot be approached except through this argument. Any effort to anticipate this process must result in an effect which is the result of some other idea expressed in matter.

That the architect may fully understand the scope and bearing of the ideas which constitute the prime elements of the art he deals with, he should have a comprehensive knowledge of the human relationships with which architectural ideas are concerned. Here we frequently meet with a representative prejudice pertaining to the knowledge of ideas in architecture, especially with reference to church architecture. It is held that the architect should be a partisan of the creed or sect for which he designs a monument, for the reason that only in this case can he be familiar with the requirements of this special church, or, in other words, that to build a good Catholic church it needs a good Catholic, and to build a good Protestant church, a good Protestant.

If we concern ourselves with the physical needs of the church only, and assume that the architect is not possessed of any information pertaining to religious ideas in general excepting those furnished by his church, it is fair to presume that the architect not familiar with the practical working of a special church would not be able to carry out the scheme without much cramming and preparation. But when we consider the art process of expressing an idea in matter, it will be found that a person without a philosophic

knowledge of the religious idea would not answer the purpose at all, whether he subscribed to the creed under consideration or not. If you wish to learn how to print, you would go to a printer, and not rest content with an examination of a printed sheet. The impressions you will find there are insufficient to give a clew to the process. There is much to be learned of the functions of the tympanum, the overlay and underlay, the proper condition of the roller and the nature of the ink, of the moistening of paper, of the peculiar construction of the lever and of the force required to work it.

The knowledge of an idea does not mean simply that one should know that such an idea exists, nor that he should know whether it be a true idea or the reverse; it means an analysis of its operation on persons who accept it as true, and whose acts and emotions are under its influence. If the architect, whose province it is to analyze an idea in this manner, is himself under its influence, he will invariably accept his personal interpretation of it and of its results. This may be fully in accordance with the true import of the idea in question; but it must be remembered that in most cases it is not. The true position of the architect—the position which it is desirable he should occupy for the good of the monument—is that of the intelligent commentator who is bent on ascertaining the true meaning of the author, without inquiring whether the author was right or wrong in what he said; when that true meaning of the author is ascertained, it becomes his duty to assume that the persons who occupy the structure accept that interpretation of the idea as the true one.

The course of education to be recommended to this

end is of course a study of history, but, withal, there is needed in this matter a sound logical mind, which, like taste, is not to any great extent a gift of nature, but which may be cultivated by the study of science and mathematics. It may be stated as a rule, that this is the only training which will insure good results. It is also self-evident that the arranging of groups of persons under the influence of an emotion demands a poetical development of a peculiar kind. The cultivation of it is to be found in literature, in painting, sculpture, and the drama.

This brings us to the subject of the education of the architect, and it is truly wonderful that a liberal education and art-training, as outlined above, is nowhere thought of. It is not until recently, say the beginning of this century, that a technical education which comprises mathematical studies has been assigned to him in the various polytechnic schools of Europe. Architects in England and America are, even to-day, mainly educated under a system of apprenticeship like that of the trades. It is only recently that polytechnic schools, in imitation of those on the continent of Europe, have been established here, where the student may acquire that knowledge of mathematics and mechanics which is indispensable to him. Yet, it is not even now obligatory that an architect should have mastered mechanics before he is permitted to practice his profession; large numbers of practitioners enjoy an extensive clientage without ever having given the subject a thought.

Practical work, under the guidance of a competent architect, as a finishing course of the young student who has theoretically completed his education and has

become an architect in a good polytechnic school, is of undoubted benefit before he attempts independent active work. But that youths, without other preparation, may become architects by serving an apprenticeship in an architect's office is a fallacy of the times. Doubtless, there may be found isolated cases of individual success, even under this system, but it would not be very difficult to point out where men so educated have utterly failed in spite of their apparent practical success, and also what amount of labor and self-denial it has cost others, who make up by private study what had been neglected in their early education.

The methods of training adopted in schools comprehend (besides mathematical studies, which at the present time are all that can be expected,) the examination and drawing of structural parts, and also of old monuments of recognized merit. In transferring architectural forms to paper in the shape of geometrical and perspective drawings, the student becomes familiar with these forms and the conventional shape they assume in geometrical drawings. He learns to write, as it were, the hieroglyphics of architectural practice, and to read them when he finds them written. But this course is pursued only in some of the academies and polytechnic schools, not in all of them, and the extent to which it is carried in the majority of schools is very limited.

What is practiced everywhere is the early and constant composition of structures by means of sketches which are prepared by the pupils and corrected by the master. This process is pursued without system, without due preparation, and with very bad results.

If in a structure we desire to tell the story of its being, if we wish to express in its architecture the idea which has given rise to its existence, it seems clear that the form of the structure is the most available element for this purpose. It is true we may build structures of arbitrary forms and paint on their walls pictures of what is going on inside, or of the occurrences which have caused people to congregate within; or we may carve in stone representations to answer the same purpose, or cover the structures with legends descriptive of the matter we wish to relate. But in these cases we are pursuing painting, sculpture, and poetry, and not architecture, for architecture is the art which, by technical methods peculiarly its own, pursues this very purpose of telling the story of a monument, and of the idea which it is to commemorate. Can this be done at all without the help of other arts? Yes! Look at the ruins of monuments of the past, ruins from which all original detail has disappeared, or at the foundation of monuments never built or entirely destroyed—they tell the story of the object and purpose of these structures. We know them as temples or theaters, forums, baths, or dwellings. Is it desirable to do it without the help of other arts? No! The main object is to express an idea, and if the sister arts of sculpture and painting assist in doing this, their help is not to be rejected.

Some architects, however, doubt that the forms of construction are an element in architectural art, and others again imagine that all possible architectural forms have been created in the past, and no new forms are now possible or desirable. Therefore the architecture of the last four hundred years selects its mon-

umental forms from the *répertoire* of history. It often happens that these forms are incompatible with the uses or with the methods of construction of modern monuments; in that case architecture yields reluctantly to use and obstructs obstinately the needed construction, or covers it up out of sight with forms which originate in other constructions. This is done without violence to the artistic conscience, upon the theory that form is a conventional entity of recognized beauty, character, and value, which once accepted by the art of architecture is not further to be questioned as to its nature or origin, but to be adopted and used without cavil.

Inasmuch as these ancient forms are often either too large or too small for the place they are to fill, the convenient rule has been adopted that parts of structure as found in the past may be increased or reduced *pro rata* without violence to art. This rule, as we have seen in Chapter XX, page 299, leads to a proportion of masses which is no longer possessed of stability, and cannot therefore be accepted as a guide in architecture. Nor is the scheme of creating a new architecture by a mere modification of old forms pregnant with the promise of success. Watt did not attempt to shape his steam-engine after the pattern of a wind-mill, nor were early shot-guns made in the form of a cross-bow. In one respect architectural monuments resemble each other sufficiently to warrant an intimate relationship of form, viz.: they are all at least temporary abodes for man, not unlike the wind-mill and the steam-engine, either of which serves as an apparatus for pumping water, and the cross-bow and the shot-gun, which are both engines of war; but these, after all, are

mere physical conditions. The nature of architectural monuments changes with the idea which prompts persons to congregate within them, just as in the steam-engine and shot-gun the motive force which performs the work (steam and gunpowder) supersedes the motive force used in the wind-mill and cross-bow, which are atmospheric currents and muscular power.

Mere modification of form is not always creation in imitation of nature. It is true, nature modifies form to respond to environment whenever environment changes gradually; but if in nature an organism is transplanted into a region of totally different environment, the organism dies, not to be annihilated, but to return into its constituent molecules and atoms, to undergo new combinations which are new functional forms, totally different from those preceding them. Art is governed by nature's laws of creation, and architecture, to be a living art, must be also governed by these laws. The historical forms of architecture have become obsolete because the environment has changed. During four hundred years old forms have not been modified, nor have new forms been created; but the conditions surrounding architecture have changed all the same, and the gap has become too great for modification now; nothing short of re-creation will meet the case. But this re-creation must proceed upon the principle of imitation. Old architectural forms must be permitted to dissolve into their elements, which are construction, material, carved ornament, and color decoration. These elements may be used as separate entities, as a basis of new forms. Of course, where the possibilities of construction have been increased, we must call into use this increase, and the material which has been added

by modern invention must be utilized and incorporated in our architecture. We cannot boast of great progress in carved ornament and color decoration, but we may learn to understand the application of it under a more comprehensive and better established system, and we may call to our aid in its use and application an advanced knowledge of mechanical laws and technical facilities.

The thing most needed to initiate such an era in architecture is, that architects must build more and draw less. This is not intended to mean that architects can be better educated as masons and stone-cutter's apprentices than in art academies, but that the student of architecture must be trained to think and reason upon a structure instead of thinking of a mere drawing. The mind of the modern architect is wrapped up in his drawings; they are to him the ultimate object of study; he imagines that if the drawing he is engaged in preparing is pleasing to him, the structure which will be built in accordance with it will of necessity be a good architectural work. Now every practicing architect will know what is here meant by too much drawing and too little building, and will probably accept it as true. To the layman it needs further explanation, and no doubt a statement of the causes of this peculiar mental condition of the architect will elucidate it. The student of architecture learns of the art mainly from drawings; he sees but little of the structures themselves. Whenever in his mind he recurs to a noted monument, it is a drawing of that monument that he means, not the monument itself. When he is engaged in composing a design of a monument, it is again the drawing he looks to as the immediate realization of his

ideas, not the structure. Again, it is this drawing which is to affect favorably the opinion of his client, hence his prime solicitude in its behalf. The student of architecture is not made sufficiently familiar with parts of structure and their mechanical function; he knows monuments mainly as a whole, and as they appear in prints and photographs. These leave upon his mind an impression which he attempts to reproduce in his work, and he thinks this may be done if he can reproduce it in his drawings. The principal characteristic of drawings, at least that which presents itself to a superficial observer, is light and shade. It has become an article of architectural faith that to produce shadows is doing architecture.

Admirers of architectural drawings discover in them also certain effects. The first and most striking of these effects is that of age and partial decay. This appearance of material decomposition is picturesque, and is hence greatly prized in prints and photographs. The reason why may be found in the fact that the appearance of a monument is in truth improved by age. Time and the weather wear off the rigidity and stiffness of a new structure, the hardness of differences in natural color and no doubt an indication also of age is a fair guarantee of stability.

Modern restorations of the cathedrals illustrate this fact most forcibly. The new parts are often built with scrupulous exactness and technical success in imitation of the spirit and detail of the old parts, yet the expression attained is inferior to that of the latter. True, much of this is owing to the stiffness and regularity of modern mechanical work as compared with old work, yet even where this stiffness is avoided new work com-

pares unfavorably with old work in picturesqueness. Now, this quality of age is always apparent in photographs, is often well rendered in engravings and lithographs, and its effect is freely made use of in the woodcuts which serve as illustrations of works on art history. From these the architectural student derives his love of this special quality of drawings, and it becomes his great aim to render his sketches and compositions in the same way. A few touches of the kind are apt to reconcile him to a vast amount of bad architecture. Another remarkable feature of architectural prints and photographs which commands the attention of the enthusiastic student is the presence of odd and curious features of old monuments which have no application in modern building, but which have become picturesque because they are obsolete, and which attract attention because they refer to physical needs or artistic expression which have become poetical by being sung in verse and painted in pictures. The young architect confounds his admiration for these poetical features with a just admiration of architectural merit. He delights in their picturesqueness, and hence believes them to be noble features in architecture which he would love to introduce in his composition. He deplores his own as a prosaic age, because of the absence of similar poetical and picturesque demands, forgetting that it is his function to elicit these demands out of the chaos of popular notions, and to create forms which depict new wants with the same pictorial facility with which these old forms have been developed which please him so much. It cannot be doubted that many modern architects have now and again realized this state of things, and have endeavored to create new forms which

shall express modern needs and shall also be picturesque; but this attempt has often failed, because their authors have become discouraged by seeming failures in the early development of these forms, which in the nature of the process must be more or less crude, and partly because a studied attempt at picturesqueness can never rise above adaptation of old forms—can never become a true art development.

One of the most potent causes of the charm of picturesque effect, in mediæval monuments and the drawings of these, is in the simple and free translation of the thought of their authors which they convey. The architects of that period built what they needed, and in the order in which they needed it, without studied affectation; without any attempt at appearances. Hence, everything they did in building became a feature in their monuments, and these collective features became picturesque; that is, they became the features of an organism which expressed its functions, and, like the picture on canvas, these monuments told the story of an idea. If we strive after this sort of picturesqueness, by storing our mind with its forms and imitate these forms in our drawings, we are not pursuing art; that is, we are not pursuing a living architecture; we must imitate it in the spirit in which it is conceived; we must do as did the architects of the Middle Ages, we must build what we need, and in the order in which we need it, physically and mentally, without studied affectation, and the result will be an equally picturesque architecture. But such an architecture cannot be conceived full-fledged and drawn on paper as a completed elevation, section, or perspective. It must grow out of building, just as the pattern

of a woven fabric grows out of weaving, and the form of a metal manufacture out of forging. Many architects and lovers of architecture, convinced of the truth of this, have suggested that architects should be practical builders; should be educated, as it were, in the shop and at the bench; also, that they should be sculptors and decorators. If this could be—that is, if the student of architecture could master the mathematical and scientific branches taught in modern polytechnic schools, make himself proficient in drawing, attend an academy of architecture, and then become in succession a good carpenter, mason, stone-cutter, painter, sculptor, and decorator—no doubt such a student would be eminently well prepared for professional life, and produce marvels of architectural art; but as human life is too short to enable one man to master practically so many arts, the question to be answered is reduced to this: Shall the pupil of architecture be educated in some mechanical workshop, in an art studio, or in a polytechnic school. The pupil of a polytechnic school no doubt is, at the end of his term, deficient in practical mechanics, and probably entirely ignorant of painting and sculpture, and it is fair to assume that a proficient painter, sculptor, or mechanic, at the end of his term of apprenticeship, will be equally ignorant of architecture, both in its theory and its practice. But the pupil of a polytechnic school has acquired a habit of study, which is foreign to the workshop and the studio, and may make himself master of the theory of art, and more especially of that of painting and sculpture, in the same way as he is already master of the theory of mechanics. What really remains to be wished for is that the education

of the architect should include a thorough course on the theory of art, if need be in the place of the course on history of art, which may, with propriety, be reserved for maturer years, and that at least an elementary practice in modelling, decoration, and mechanical work should be part of his school education. The latter is now done to some extent in some of the better polytechnic schools. But what is done tends to illustrate only what the pupil has previously learned to do in drawing. This order of things might be reversed to advantage. The pupil should be impressed by his education, first with the importance and necessity of a thorough knowledge of the theory of mechanics and of the fine arts, next of the application of this theory to the practical work; while drawing should be considered as a mere notation of thought referring to practical execution. With a view to this end, the technical instruction in drawing (which to insure fluency must of necessity precede a complete theoretical knowledge of mechanics) should be mainly confined to free-hand drawing, and whenever architectural or mechanical drawing is practiced, during that time it should be limited to parts of structure (the more elementary the better), and every such drawing should be accompanied by plans, sections, and a perspective sketch, that the mind of the pupil may constantly dwell upon the form of the object he depicts, and not merely upon its surface. Or, better, drawing should be practiced entirely from the model.

Architectural ornament should be drawn from the object, first in its natural form, and then conventionally. If possible, the translation should in each effort

be made to two or more materials and illustrated in relation to various parts of the structure.

This is not the place to enter into the detail of instruction, but it is desirable to make it perfectly clear that the architect, to compose well, must compose a monument which he may jot down as he proceeds in the form of a drawing, and he must not compose a drawing, which, when executed, may be a monument.

Only those who are capable of analysing the relation of the various external elevations of modern monuments to each other, and to their internal sections, and who perceive the existing discords, can realize the pernicious influence of the modern system of doing architecture purely through drawings.

How shall I build this thing? should be the constant question of the architect while composing, instead of what form shall I give to it? If the former question is responded to in our composition; if this question is intelligently answered at every step of progress, forms will grow out of it; but if we design monuments in response to the latter question, the monument is never contemplated seriously, scientifically, or artistically, as a whole, but as an aggregation of disjointed parts; hence the other question, How can I join this and that together with architectural propriety? is the question which most frequently occurs in modern architectural composition. The moment the architect finds it necessary to ask or answer this fatal question he may be sure that he is pursuing the wrong course. He has started his work with completed forms, and is not developing them.

All parts of structure perform mechanical functions, hence their form must be primarily determined by

mechanical laws. The modern architect ignores this fundamental law. He believes that there is a relation of a mechanical nature between superincumbent mass and the area of the supporting pier, between the lateral thrust of an arch and the resistance of its abutment, but he deems it an intrusion to remind him that no part of structure can be determined in its mass or outline without due mathematical consideration.

It is not intended in these pages to enter upon a detailed analysis of this principle and its practical application. The subject is too large to do justice to it in the short space which can be devoted to it here; but to make the principle more clear, by an illustration, we may mention one special structural feature, viz., the capital, which is almost invariably misunderstood in modern practice. By many it is imagined that its height, for instance, depends mainly upon the diameter of the column which it crowns. This is the Renaissance error, and is derived from the rule now taught, that the height of a capital may be expressed in diameters of the column, or that it must bear a certain fixed relation to the thickness of the column. Others, again, design the capital to correspond with the length of the column which supports it. Exaggerated capitals of this kind are to be frequently found upon the thin and long wall shafts of modern Gothic structures. Many others, again, refer the size and shape of the capital to the general form and dimensions of length and diameter of the whole organized pier of which it forms a part. Very few, indeed, seem to understand its function and true mechanical value. The capital is the cornice or crowning stone of a shaft or pier, and connects this shaft with its load, which is

always of larger area than the shaft at the point of connection. This difference of area itself depends upon mechanical considerations, which, for this present purpose, may be omitted, but it alone determines the projection of the capital. Now, the height of the capital is the resultant, first, of the needed projection; second, of the position in relation to the eye; third, of the shape of its own bell, whether it be concave or convex; fourth, of the nature, strength (capability to resist pressure), of the material it is made of; and finally, of the degree of strength and elegance pertaining to the monument in question. It is not intended to convey the idea that all these elements which constitute the proportions of the capital must, or always can be, mathematically demonstrated; but it must be clear that, inasmuch as they form the mechanical elements of its mass, they must be mechanically considered, and at least approximately realized, to enable the architect to attain to the best and most expressive form possible.

It is a well-known fact that in the construction of roofs, bridges, and trusses, made possible by the invention of modern rolled iron, the calculation of the strains of a projected construction, and the determination of the sectional area of the various parts which resist these strains, are the least part of the engineer's labor in designing these roofs, bridges, and trusses. The greatest part of the work is, of necessity, bestowed upon the connections where strains are concentrated upon bolts or divided upon rivets, and where the material is constantly weakened by perforations, and must be constantly strengthened again by additional plates or special castings. Now when we look upon

a structure of this kind, one that is well and conscientiously designed, these connections or knots, as they are called, address us very forcibly, and convey a convincing expression of their strength and adequacy to do the mechanical work they perform. In them, nothing is attempted beyond this adequacy of strength; but inasmuch as, by reason of economy and mechanical convenience, this cannot be attained by the mere weight of abundant material, but only by the most scientific application of the material at the disposal of the engineer, the result of these constructions is a species of art-form, which speaks forcibly of mechanical work done, and is hence possessed of beauty. We perceive in these works of the engineer the true spirit of art-force and the resultant pleasurable emotion. Some of these iron structural parts have been successfully treated by the architect with color decoration and ornament wrought in metal, and thus been elevated into works of fine art. It is for their primary development of form, however, that they should be recommended to the student of architecture as a potent schooling in the mechanical consideration of the material function of structural parts.

An architect may design a very clever capital, bracket, or cornice, etc., by groping for it, and elaborating and developing it out of his inner consciousness. But it must be remembered that to do a work of fine art is to do it with premeditation, that the artist must know what he is driving at, and must possess the technical skill to approach it and bring it to completion by direct methods. This technical skill is acquired by long-continued practice. While the knowledge of what is to be done is of a scientific nature, it is posi-

tive, logical, and analytical in its character, and must be diligently studied and mastered by the architect if he is to do his work with premeditation, for only then is it a work of art.

As soon as the student has mastered his mathematical studies, and become an expert draughtsman, and has been taught the principles of architectural modelling and decoration, and the use of color in application to structural forms, he should be initiated into architectural composition by problems involving, at first, merely parts of structures, as, for instance, a pier supporting a given wall imposed upon an arch or lintel; the cubic contents of the wall being known and the height of pier given, the transverse area of the pier may be readily determined. Now the pupil should be made to model this pier, arch, and wall for a series of structures of different degrees of strength and elegance, from a servant's hall up to a church aisle. He should elaborate some of these drawings with carved ornament and color decoration. He should be made to prepare two or three examples of each kind varying in richness, and should in this process be corrected as to the proper relation of modelling to be adopted in each part. From this simple example the pupil should be gradually permitted to advance toward more extensive combinations, and finally to whole structures of a simple kind, and so on to the end of the chapter. There should not be one word spoken of style; in fact, the study of art history may be safely postponed to the last year of instruction; or, if the pupil has dabbled in art history before it is good for him to do so, he should be promptly impressed that what he finds there is not to be a

criterion of what he is to do, but simply a statement of what others have done under circumstances which will not occur again.

The character of his work must refer solely to construction, and the construction to the idea which is to be expressed and to the material which is at his command for that purpose. He should learn in this practice the difference of treatment which is due to the material used; that wood needs different modelling from stone, and stone different modelling from metal; and he should learn also the methods of conventionalizing decorative ornament, which depend upon material and function. A dozen pupils of fair abilities and general education, well grounded in mechanics and drawing, guided by a teacher who is not a professed militant in the battles of style, will, if trained in this manner, produce an era in architecture, always provided that they are permitted to do work and not to spend their time in preparing drawings for the approval of persons who have enjoyed no architectural education whatever.

A child could not well be taught the English language if we insisted on beginning with the dialect of Chaucer, and so going on to the English of to-day. Astronomy is read at universities as developed at this time, not as it was at the time of Hipparchus. Of what use would it be to teach geography upon a map of the Roman Empire, or science according to the theories of Swedenborg? There is no doubt a historical value in all such teaching, but the student cannot well commence the study of the theory and practice of a living art by a perusal of an art that is dead. The radical error is to be found in the opinion of those who

teach. They do not believe that Greek architecture is dead; they would have us think that it still lives, and try to think so themselves; but it *is* dead, and so are Roman, Byzantine, and Gothic architecture just as surely dead as the language of Chaucer and the astronomy of Hipparchus. These styles are all metals which have undergone various combinations with oxygen, one and all oxides of architecture; you may, if you please, apply to them the poles of your analytic battery, and extract grains of pure iron from this historic rust; but if you wish to have your horses shod to-day, *now*, because you need them, let the smith take metal from his own store and let him forge it into shoes that are serviceable *now*, at once, lest, if he wait for the operations of your battery, the horses die before you procure iron enough out of the shield of Piramus or the spear of Achilles.

Greek poetry and sculpture stand foremost in the ranks of art, both in their intrinsic and relative value; they have never been surpassed. Greek science and architecture, considered as the outcome of an early civilization, form an epoch in the cosmic history of human culture and art, which, in brilliancy of attainment, also has no parallel in subsequent relative progress; but both science and architecture have grown since the days of Pericles. The science of the nineteenth, and the architecture of the thirteenth, century manifest a conscious manly mastery of the multitude of questions which have arisen in science and art since Greece dazzled the world with her childlike dallying with their rudiments. Her genius will ever command our admiration, but we cannot afford to deny our manhood by neglecting the earnest work of

our time in the continuous worship of a divine example.

Young men between the ages of twenty and twenty-five, who should be engaged upon something which will make them useful members of society, are made to bend over the drawing board for six hours daily, drawing an acanthus leaf and a volute, as the sum and substance of carved decoration. They are told that the Corinthian capital is the greatest triumph of architectural art. There is no truth in all this. The acanthus leaf was never treated in Greek architecture so as to express capacity to carry a load; there are too many leaves in the Corinthian capital; they are weak, drooping—not strong at all—and so are its volutes. What is the use of nursing enthusiasm for the poor Corinthian capital? Let us respect it as a work of art in the place where we find it, and for the time in which it was made; but to say that it is the sum and substance, the ultimatum of human art, that there is nothing more to be done by young men who are possessed of souls but to draw that thing over and over again, that they may become architects and draw this same thing again during their natural lives, and go into ecstasies over it, and call it art, and try and make others believe that nothing else can be produced which is equally good, is a sin, for it is a falsehood, and a gross one. Nor is the pursuit of this sort of architecture art in any sense. Suppose that it were true that the architecture of Athens is perfect, that it answers all purposes for all time to come; that the proportions of its structural parts are settled beyond doubt or possible change; that its decoration and carved ornament are things finished and completed, then what is the use of

academies of architecture? There are many clever mechanicians of our day, who will construct a machine which will produce endless designs of this kind for all time to come. This perfection and infallibility of antique architecture has remained undisputed long enough; it has done all the harm that can be reasonably conceded to any one human prejudice or error. It has been treated by its very opponents with great courtesy and forbearance. There is gathered around it a halo of poetry, of physical human vigor, of human virtue, courage, and patriotism, of human rights and philosophy, which must deter all thinking men from disturbing its intellectual and moral radiance. But it cannot be necessary that it should be dragged from its proper place to do duty and perform a function to which it is ill calculated to respond. As sincere and earnest partisans of its historical glory, we should desire that it remain forever in its historical shrine.

The dilettanteism of modern architecture must be rooted out before the art can revive and exercise a wholesome influence upon society. It must be understood by all, and more especially by those who desire to become architects, as the first and most important lesson of their education, that the road to architecture is long, tortuous, and thorny, and not a well-paved highway upon which man may amble into fame; that the days of false taste are numbered, and that the time is not far distant when *style* will follow in the same direction, and nothing be left but to pursue architecture pure and simple.

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